RAILROAD GAZETTE

FRIDAY, OCTOBER 26, 1877.

Contributions.

Universal Time.

TO THE EDITOR OF THE RAILROAD GAZETTE:

We may safely say that no country on the face of the globe is more in need of one *common* or *universal* time by which to govern the running of trains and steamboats and other modes of conveyance within its borders than the United States. Here is a vast net work of railroads spread over a great portion of the country; one line stretches from ocean to ocean, and others will soon be built, followed by lateral lines to connect them. Thousands of steamboats are daily plying between points of trade and interest upon all the natural highways of the country, the lakes and rivers.

The interest of those who own railroads and steamboats, as well as the interest of the people, requires that they all be run in unison with system and regularity. One of the great inconveniences attending an arrangement of this kind is the want of a common, or, as we shall term it, universal time. It will not be necessary for us to refer to any particular place, where perhaps trains come and go by New York, Pittsburgh, Cincinnati, Chicago and local time; the traveling community are well aware of these annoyances, as are also those whose duty it is to make up a time table that shall connect their roads advantageously with others.

And oftentimes when we see a cablegram in the papers, from some foreign country, after considering the dates and figuring on the time elapsed from time of sending to time of receiving, we are not sure but we may be out 24 hours one way or the other.

To obviate these difficulties we will offer the following suggestions: Establish a *prime meridian* to pass through Behring Strait, and let the day by local time commence at this line, and also the day universal, but 12 hours later, or when the sun is on this line, the hours of the day universal to number from 0 to 24; and also let longitude be reckoned from this line, numbering from 0 westerly around the globe to 360°, the universal time to be given daily by telegraph to the principal cities throughout the Union by the astronomer at Washington. All schedule time of railroads, and steamboats and ocean steamers as well as official documents and telegrams should be made out in universal time. The local publication of time tables for railroads and steamboats, however, should also be made out in local time.

In order that we may see what effect different positions of the earth on its axis may have on diurnal time, we will first suppose the sun to be on the meridian of Yedo, in Japan, at Monday noon, and the earth turns on its axis from west to east, in due time and in the following order he will come on the meridians of Pekin, Constantinople, London, New York and San Francisco, and it will be Monday noon at each of these places. The sun will now cross the Pacific Ocean, and at 24 hours from time of starting he will be on the meridian of Yedo again; but instead of Monday noon it will be Tuesday noon, making a change of day somewhere in the Pacific Ocean. We are not surprised that this should be the case when we consider that "westward the course of empire takes its way;" that when the torch of civilization was passed along from Asia into Europe, the calender came with it. The two were then transferred to the eastern shore of America by Columbus, and others who followed after. They were then taken up again by emigrants and carried across the American Continent to the Pacific Coast. The torch may throw its enlightening rays over the globe for an indefinite length of time, but the calender records time in periods of indefinite lengths, governed by that *perfect* and *grand old time piece*, the *sun* and *stars*. Consequently diurnal time by means of the calender has been carried connectively around from the eastern shore of China westwardly to the western shore of America, leaving the change to be made in the Pacific.

Let us now establish a *prime meridian*, and call it the *day line*. This should, if possible, pass entirely through water, in order to avoid annoying the inhabitants of any country, by having, say Sunday, on one side of a located line, and Monday on the other. We will find by looking on a map of the globe that the most suitable place for this line is a meridian that shall pass through Behring Strait, at about Longitude 167°, west from Greenwich. Having established this line, we will consider what portion of the earth's surface will be under any particular day at any time. Let Fig. 1 represent the earth, the observer looking down upon it from the North Pole. We will suppose, for sake of convenience, that the earth is stationary, and that the sun, *S*, is going around the earth from east to west, as indicated by the arrow. When the sun is at *A*, it will be midnight at *C*. Now let Monday commence at *C*. When the sun is at *B*, from *C* to *D* will be Monday; when the sun is at *C*, then *C D A* will be Monday, and when he gets around to *A* again, it will be Monday over the whole earth. Now, since it has taken 24 hours to encompass the earth with Monday, it must take 24 hours more to get entirely rid of it. Therefore, any day by local time must be on some part of the earth 48 hours.

We will now see what effect combining both local and universal time will have. First, we will have both days to commence at midnight and from the day line. When the sun is at *A*, Monday, as we left it above, is over the entire earth for an instant, and then Tuesday commences, and, by local time, if there be one hour of Tuesday there must be 23 hours of Monday; but, by universal time, this would be called 1 o'clock Tuesday the world over. Thus we see that we would have a difference of one day to start with, which would be inconvenient; besides, commencing the universal day at midnight will not suit our purpose, as will be seen farther on. We will therefore commence the day universal 12 hours later than the day local, or at the moment when the sun is on the *day line*, and this will be at the moment when half the earth is Monday and the other half is Tuesday, local time; but we will commence Tuesday universal, numbering the hours from 0 to 24, and it will be Tuesday the world over for 24 hours, and then it will be Wednesday for the next 24 hours. Now when the sun gets to *D*, from *C* to *B* will be Monday and the rest of the earth will be Tuesday, and when he gets to *A*, then it will be Tuesday over the entire globe both by local and universal time, and this is the time when the dates of the two systems must agree.

Longitude should also be reckoned from the *day line*, numbering from 0 westerly around with the sun to 360°, instead of 180° east and west, as from Greenwich. This notation without the initials "E" and "W," would be a distinctive feature of this system from all others. Knowing the time universal when the

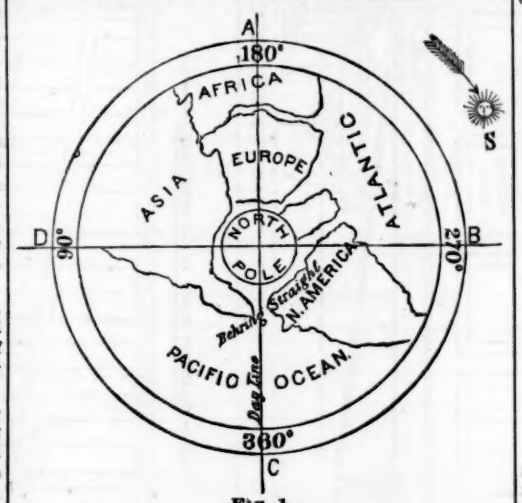


Fig. 1.

sun is on the meridian of any place, that time will be the longitude of that place in hours; multiplied by 15 will give it in degrees.

Navigators when sailing westerly around the globe when they cross the day line should add one day to their reckoning, for they are sailing as it were out of Monday into Tuesday, and when sailing easterly across the line should deduct one day.

The ordinary time-piece may with a little addition be made to serve for both universal and local time.

Two sets of hands are required, a plain set for local time and an ornamental set for universal time. Two sets of figures are also required, Roman figures for local time, and Arabic figures for universal time, as shown in Fig. 2. The additional

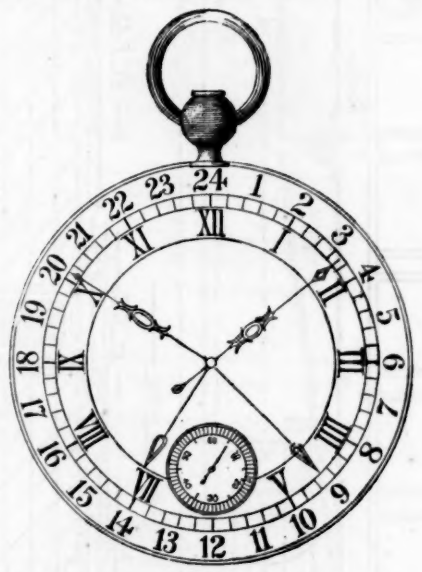


Fig. 2.

mechanism is what is required to make the hour hand of the universal time go half as fast as the hour hand of local time. No change in the motion of the minute hands is necessary, for the Roman figures will do to read the minutes from for both times. The time as indicated on Fig. 2 is L. 7h. 22m. a. m. or p. m., and U. 20h. 8m. The want of a. m. and p. m. suffixed to the universal time will always distinguish it from local time. If it were thought preferable, an extra face for universal time could be added to the back of the watch.

Another plan would be to have the hour hands of both times make one revolution in 24 hours, and the minute hands one every two hours, the Roman figures to commence at XII at the top of the dial and run to XII at the bottom, and then on around to XII at the top again. In the navigator's chronometer there is no need of local time hands and figures.

The universal time watch could be used with considerable accuracy as a compass in the following manner: Suppose the hour hand of U. T. points to 18h. 40m. at New York when the sun is on the meridian of that place. Now at any time near the meridian of New York when the sun is visible point the hour hand of U. T. toward the sun. Then will 18h. 40m. on the dial point due south. A movable card or plate with the points of the compass marked on it could be attached to the watch, the south for the city of New York being set at 18h. 40m.

JOHN WATERHOUSE, C. E.

LAMBERTVILLE, N. J., Oct. 12, 1877.

Radius of Cross-Over for a Curved Double-Track Road.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The following problem is presented to your readers for solution: Given a double track of 4 ft. 8½ in. gauge, curved to a radius of 800 feet measured to the centre line between the tracks, which are placed 7 ft. 6 in. apart from inside to inside of the two middle rails. What is required is the longest radius which can be used for the compound curve *A B* forming a turn-out track which shall be 175 ft. long from a point opposite the heel of one switch to a point opposite the heel of the other switch. This distance is therefore the length of a chord on the centre line between the two tracks as shown in the diagram. The switch rails are supposed to be bent so as to conform to the curve of the cross-over, so that the problem is, to give the radius of a curve, *A C B*, which shall be tangent to the inner track at *A* and to the outer track at *B*, and the two ends of the turn-out to be tangent to each other. It can be solved easily graphically by trial, but what is wanted is a geometrical or analytical solution.

Passenger Bogie Cars for the Buenos Ayres & Campana Railway.

We give this week engravings, copied from *The Engineer*, of what that paper calls "certain first-class cars on the bogie system designed by Mr. James Cleminson, of Westminster, and built under that gentleman's supervision in this country for the Buenos Ayres & Campana Railway."

Several of the peculiarities of construction will interest American car-builders, and some of them would be well worth consideration and imitation. The construction of the draw-bar especially should be carefully examined. The arrangement by which it is "brought in the plane of the greatest strength of the frame" is particularly noticeable. It is hard to say how the method of "tacking on" the draw timbers to the main frame first originated here, but probably it was first used in order to keep the draw-bar low enough on cars which would otherwise be too high. At any rate it is entirely unmechanical, wrong in theory and bad in practice, as has been shown a thousand times by the destruction of the platforms of cars in slight collisions.

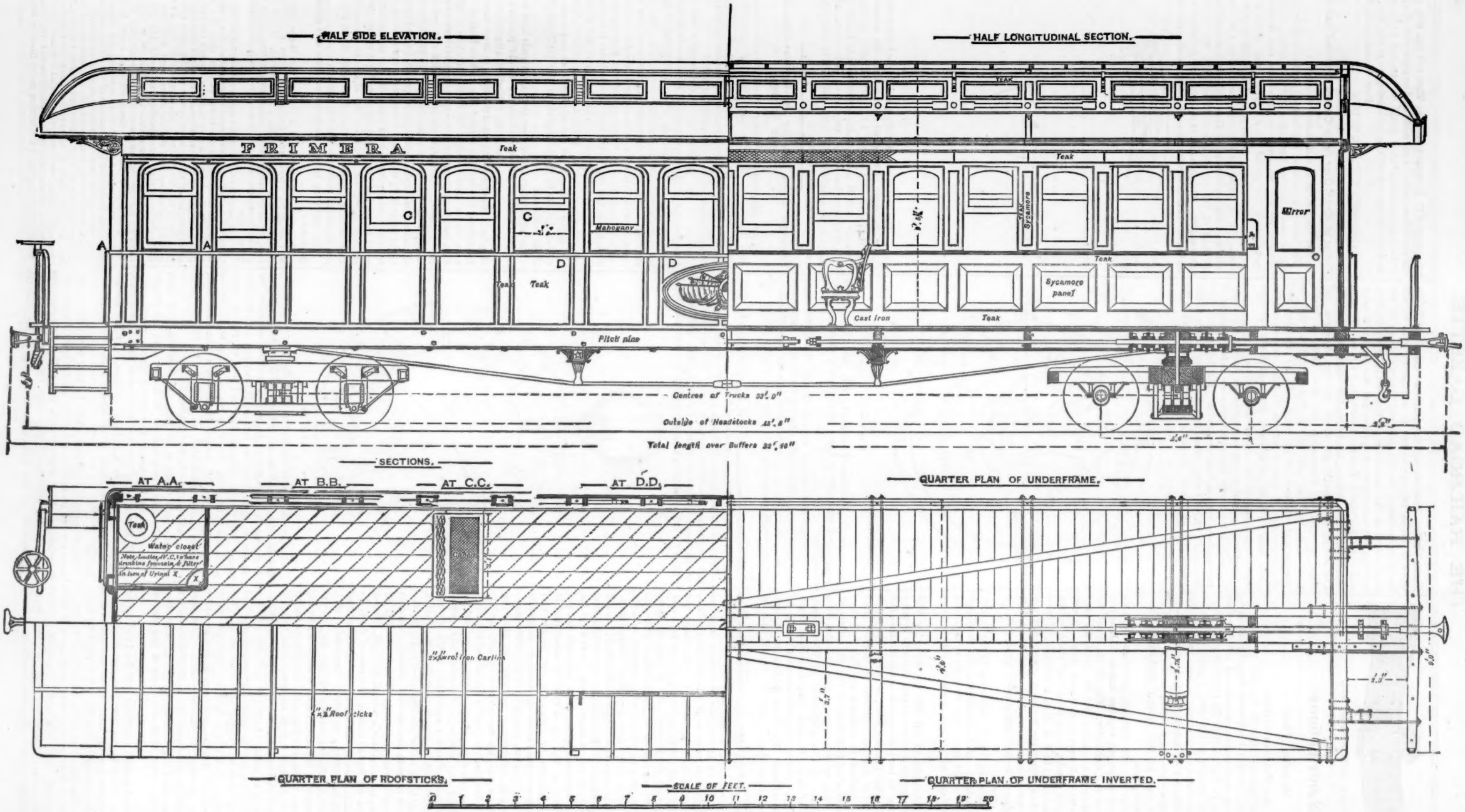
The safety chains which our English friends have used some of our American master car-builders should ponder over, and if they compare them with the ridiculous attachments which they have sometimes employed it ought to cause them to seek forgiveness for their mechanical sins. These English builders have shown more wisdom in the construction of this part of their cars than the American car-builders have whose work has been imitated. The safety chains are made of 1 inch iron, instead of ⅝, which is common here. The attachments consist of plates with strong solid eyes forged on, instead of miserable hooks made of ¾ in. iron. These plates are securely bolted to the sill of the car frame with four bolts and to the corner of the truck frame, and in case the car should get off the track some reliance might be put upon the chains to prevent the truck from turning around crosswise of the track, which is more than can be said of many used in this country.

The following is the description of these cars given by *The Engineer*:

We believe we are correct in stating that these cars are the first which have been built in England upon the principles of construction prevailing in the United States. There are, however, some departures from American practice, which we shall presently explain, and which are, we think, improvements in many ways.

It will be observed that the cars are mounted on four-wheeled bogie trucks, whose pivots are 33 ft. apart. On reference to the details of body framing, it will be seen that the sides are built up in the form of a girder, and although the body is 45 ft. 6 in. in length, facility of shipment required that no part of the structure should be too large for the hatchways of the steamers running to the River Plate. To accomplish this without impairing the strength of the structure, and with the smallest amount of material, considerable ingenuity appears to have been brought to bear, for while the side is cut up into four sections for the purposes of transport, the aggregate strength of the whole is restored when the upper and lower truss planks and the top girth—each of which is of the full length of the body, and constitute the members of the girder—are secured in their places; the tie rods, passing as they do through the top, middle and bottom girths, and also through the sill or sole bar of the main frame, hold the framing firmly together and bind the several sections up as one whole. The truss planks, and also the main frame, were taken apart and bundled for shipment. The whole structure is further strengthened vertically in the usual way, by means of the trusses under the sole bars; it will

GENERAL DESIGN OF FIRST CLASS CARRIAGE



PASSENGER CARS FOR THE BUENOS AYRES & CAMPANA RAILWAY.

Mr. James Cleminson, London, Engineer.

be noticed, however, that the bearings of struts of the trusses have large surfaces, in order to better distribute their support.

The roof is of the Monitor type, that is to say, raised in the centre. The sides are framed in one piece from end to end, and are fitted with glazed sashes, hinged or rather pivoted to open inwards. Strength is imparted transversely to the roof, which is of itself extremely weak in form, by means of seven wrought iron carlines or rafters reaching across from side to side, and following the outline of the roof. The feet of these carlines take the tie rods of the body framing, and thus bind the roof and side framing firmly together. The main or under frame is constructed with diagonals, which have been introduced latterly in American practice, to more effectualy resist the effects of collisions at the corners of vehicles, and, like all cars now built in the United States, the bottom of the frame is cased or boarded over for the purpose of preventing the lodging of snow in the framing in winter, and of dust in summer. The previously mentioned departures from the ordinary practice of American car-builders consist chiefly in the mode of ventilating, and in the buffers and draw-bars. In the ventilation of the cars under consideration the air is introduced into the spaces between the windows at a point near the top girth of the body framing, for which purpose the facia board is placed some little distance off the stanchions, leaving an open space between the upper and lower facia boards, running the whole length of the car. Upon entering the cavity between the stanchions, to which access is given by the said open space, the air descends to the middle girth, and then percolates through the wire gauze at the back of the fretwork panel covering the cavity in question in the interior of the car; the percolation and the consequent introduction of the air at the point indicated is produced by the exhaustion of the air within the car, which is effected as usual at the highest point in the roof, but with fixed exhausters, which are self-acting and require no attention. This arrangement of ventilation has the effect of maintaining an equal temperature and pleasant coolness in summer within the car, even when all the windows are shut, and the air is diffused by the wire gauze in a soft breath, as it were, over a large area on its admission to the car, while dust is at the same time completely excluded.

In all cars in the United States the buffers are always situated at a point below the main frame, having the appearance of being tacked on to the frame. They are thus not in the plane of the greatest strength of the frame, but, on the contrary, are a long way from it, and this is why slight collisions are so destructive to the platforms of American cars. Many devices have been introduced to mitigate this evil, among the most successful being what is known as the Miller platform. Mr. Cleminson has avoided this defect, however, by placing his buffer in the centre of the depth of the main frame, and has thus concentrated all the strains incident to buffing and drawing in the plane of greatest resistance.

The form of buffer and draw-bar which Mr. Cleminson has designed in this case gives what may be called an equilibrium buffer and draw-bar, for whether the action be buffing or drawing, the resultant strain is distributed equally on the whole of the springs, and they are compressed to an equal degree on each side of the central block against which they bear, and in this way the frame is relieved of all shocks and sudden strains. The draw-bar at the outer end is composed of two pieces of angle-iron so disposed as to form a sleeve of a square section, within which the buffer rod slides, and at the outer end of the sleeve or draw bar is fixed a peculiar shaped hook, to which is attached a chain, hook, and screw coupling for the purpose of coupling the buffers up tight.

The bogie trucks are of the standard type in use in America with some slight modification—as will be seen in the form of the axle guards, which in this instance are made of flat wrought iron—and also in the manner of carrying the compensating beams which are attached to the bottom of the axle-boxes, instead of resting, as is usual, on the top of the same; this was done to gain space between the upper surface of the axle-boxes and the truck frame, in order to keep the buffers as low as possible. It will be observed that the trucks have swing bolsters, and possess all the refinements peculiar to American practice. The wheels are entirely of wrought iron, and have steel tires secured in their places without bolts, screws, or rivets. The brake is arranged so that it may be applied to both of the trucks from either end of the car; the brake blocks are made in two pieces, one being a permanent fixture on the beam, and receiving a shoe which takes all the wear, and which may be replaced when worn out without disturbing the other piece.

Railway Freight and Passenger Conductors' Mutua Aid and Benefit Association.

The third annual convention of this association met in Chicago, Oct. 11, President J. G. Shearman presiding, and about 200 delegates being present. The convention was opened by addresses from Messrs. A. J. Dunning, of the Chicago & Alton, and Steele, of the Michigan Central, on the purposes and methods of the association. Committees were appointed on the general business of the convention and on revision of the constitution and by-laws, and the convention adjourned until the next day, after a vote of thanks for the addresses delivered.

On the second day the Secretary reported 1,072 members now in good standing. The receipts for the year had been as follows:

Balance, Oct. 1, 1876		$106 77
Receipts		11,569 65
Total		$11,676 42
Payments for death claims	$9,811 00	
" " expenses	1,600 55	
		11,411 55
Balance, Oct. 1, 1877		$264 87

The constitution was amended so as to require that all new members received must be under 55 years of age; also to render more strict the rules governing relief to disabled members.

After electing officers Mr. John T. West, of Minneapolis, Minn., was chosen to deliver the annual address next year, and the convention adjourned. The meeting was closed by a banquet, which was much enjoyed.

The Sale of the Empire Line.

The annual meeting of the stockholders of the Empire Transportation Company was held in Philadelphia, Oct. 17, when the contracts for the sale of the company's property to the Pennsylvania Railroad Company were ratified. The transaction is embodied in three contracts: The first stipulates that the Empire Company shall transfer to the Philadelphia Trust, Safe Deposit & Insurance Company, as trustee, its merchandise, cars and equipment in the condition and in the places in which they may be at the date of this agreement. The same is then to be leased by the trustee to the Pennsylvania Railroad Company. As the consideration for this transfer the Empire Company is to accept the certificates in the form presented in the lease, as follows: 1,155 certificates, Nos. 1 to 1,155 inclusive, for $1,000 each, $1,155,000; 660 certificates, Nos. 1,156 to 1,815 inclusive, for $500 each, $330,000; 1,650 certificates, Nos. 1,816 to 3,465, for $100 each, $165,000, or 3,465 certificates, representing a total of $1,650,000.

The oil car equipment is transferred to the Pennsylvania Company for Insurance on Lives and Granting Annuities, as trustee, under conditions similar to the former, the consideration being certificates issued by the trustee amounting to $900,000. All the pier property, depot and shop property, office furniture, offices, old and new material for construction and repair of cars is sold to the Pennsylvania Company for $450,000 in railroad mortgage bonds. The railroad company assumes all existing contracts, but they will not be liable for anything done or omitted to be done by the Empire Company previous to October 18, 1877.

The second contract provides for the sale to John F. Freeman, Wm. Rockefeller, Geo. F. Chester, Wm. H. Vilas and Jabez A. Bothwick, in consideration of $501,652.48 in hand paid, of sixteen-twenty-fifths, or 1,600 shares of the capital stock of the Sone & Fleming Manufacturing Company, limited, whose shares are valued at $100 each, fully paid, and also the entire capital stock of the Philadelphia Refining Company, whose capital stock is in 5,000 shares, of the value of $50 each. It is mutually agreed that this sale and transfer shall take effect on the first day of October inst.

The third contract provides for the sale to William Brown, George M. Vilas, George F. Chester and the Standard Oil Company of the entire capital stock of the Empire Pipe Company, the par value of whose stock is $50 per share, and also the entire capital stock of the Olean Petroleum Company, of New York, to wit: 4,000 at $50 each, full paid, including all the stock and appurtenances thereto, the consideration being $1,094,805.56.

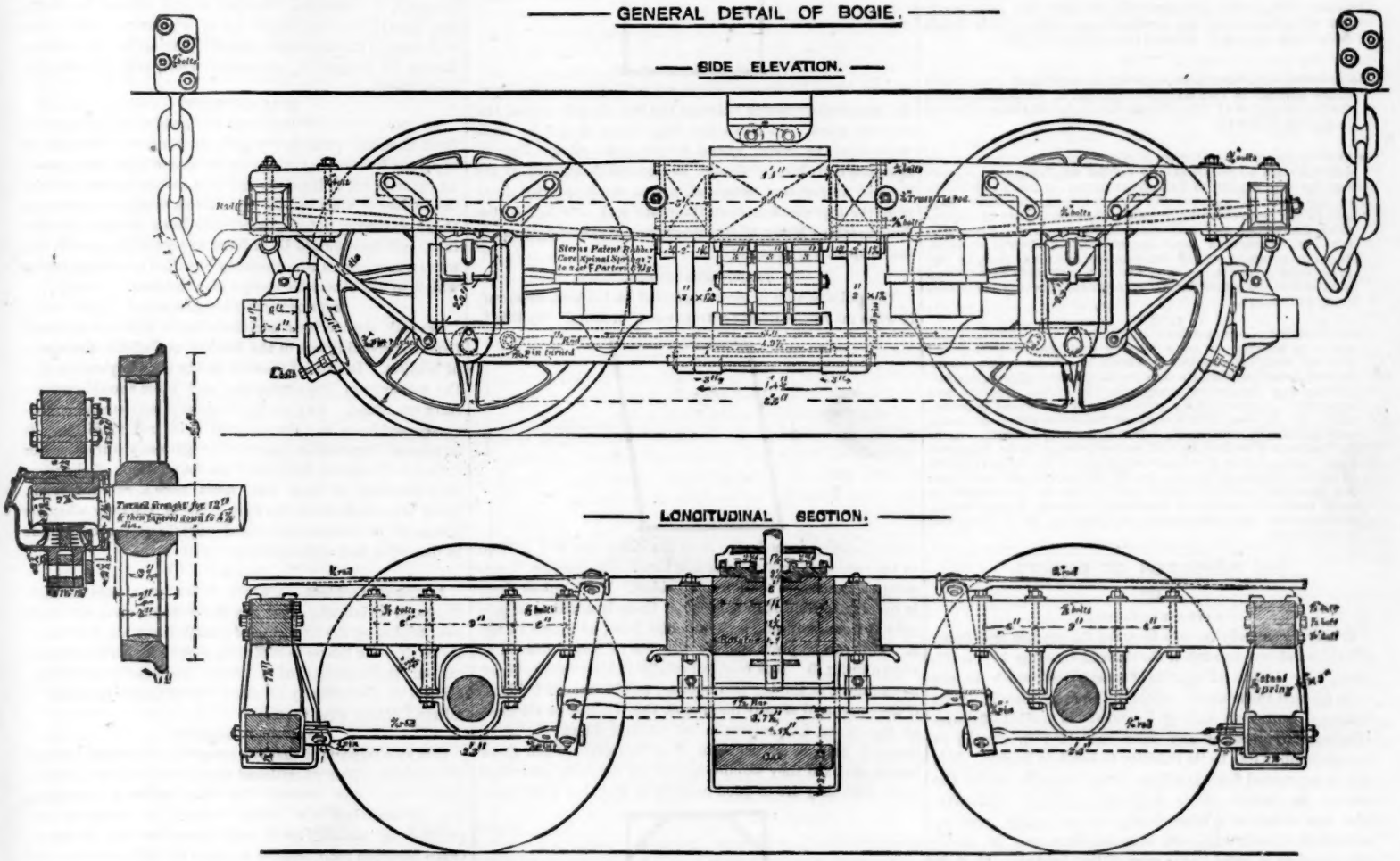
It will be seen that the pipe lines owned by the company are transferred directly to the Standard Oil Company, and not to the Pennsylvania Railroad Company. The stock of the Erie & Western Steamship Company was not included in the transfer.

President Potts stated at the meeting that each stockholder in the Empire Company would receive $25 in Erie & Western stock, $25 in other securities, chiefly car-trust bonds, and from $12 to $20 in money for each share. The total amount of the consideration for the property sold is about $4,600,000, of which $2,500,000 is payable in cash, and $2,100,000 in securities. Out of this amount $1,000,000 in bonds, and some other debts are to be paid.

The business of the Empire Company for the last year was reported as follows: Total number of barrels of oil moved by rail, 2,971,337, and by pipe, 2,337,040; total number of tons of freight of all kinds moved, 1,524,111; total tons moved one mile, 796,181,906; total net freight rates collected, less the amounts paid over to the roads, $2,577,265.36.

The interest received from the various auxiliary lines and from investments was in excess of interest paid. The net earnings have met the reduced dividends and left some surplus.

The Pennsylvania Railroad Company gives notice that the oil traffic heretofore transported by the Empire Transportation Company under the names of the Green Line and the Empire Line, will be continued under the name of the Green Line.



"BOGIE" FOR PASSENGER CARS FOR THE BUENOS AYRES & CAMPANA RAILWAY.

A New Vacuum Brake.

The Springfield *Republican*, of Oct. 13, says: "A new noiseless vacuum-producer for railway brakes, invented by Eugene F. Lewis and Luzerne Spaulding, of Norwich, Conn., has been put on the Sargent engine of the Boston & Albany road, and will be tested to-day. The main principle is in turning the engine's cylinders into air-pumps, thus producing by the pistons' motion a vacuum action on the brakes even more satisfactory than the regular jet brake, whose noise has become a grievous nuisance. All the piston heads are connected with a pipe which passes under the cab, where a combination valve is under the control of the engineer. By pulling the lever a certain distance the brakes are operated by the power from the pistons, and this would be the ordinary manner of use; but by pulling it still farther, when sudden stoppage is desired, connection is made with the vacuum drum at the rear of the tender, which has a capacity of 3,500,000 cubic inches and a vacuum power of 25 half pounds, 30 being a total vacuum. Steam being shut off, and the reversing lever put in at the six-inch notch, where the vacuum works best, the pistons at once begin pumping out the air, cage checks preventing any backward flow, and the action exhausting the air in the drum, when not required on the train. The engineer can release the train in an instant by admitting air to the pipes under the cab. This appliance costs upward of $200 per engine, but no steam is needed; on a long down grade, as from Pittsfield to Chester, the regular boiler pressure need not be kept up to work the brakes as at present, and that car-splitting noise is entirely avoided. The only apparent drawback is that in the not giving the valve full play, as is usual on shutting off steam, may wear uneven the valve seat; but the inventors think there is no danger. * * The brake has just been successfully tested by the Norwich & Worcester road authorities, who highly recommend it."

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Editorial Announcements.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

THE INSPECTION OF BRIDGES.

III.

LATERAL BRACING.

It may be entirely in vain to make the trusses and floors of bridges strong enough if the lateral bracing is insufficient. By the lateral bracing is meant that which is put in to prevent the trusses, especially the top chords, from bending, and thus failing by what is called flexure. Weakness in a post of any kind subjected to strains of compression is due to its liability to bend or buckle. If it can be prevented from bending, it will usually resist the strains to which it is subjected, without difficulty. The top chord of a truss bridge is in reality nothing more than a horizontal post, if such a term may be used, whose length is equal to the span of the bridge. If it is regarded in that way the reason which makes it necessary to prevent it from bending sideways is very apparent. In through or in deck bridges it is comparatively easy to provide lateral bracing, which is done simply by putting compression members between the two chords at right angles to the latter, with diagonal tension rods which cross each other between these compression members. It is in some respects more important to have such bracing between the top chords than between the bottom chords, because the former are subject to compressive strains which tend to bend them sideways, whereas the tension in the bottom chords will draw them in a straight line. But the shocks due to the oscillation of the trains must always be resisted by the lateral bracing at the floor system. Besides this, the force of the severest winds must be provided against, and as the floor exposes more surface, the lateral bracing at the floor should always be stronger than at the top in a deck bridge, or at the bottom in a through bridge. In deck bridges especially the lateral bracing at the bottom chord is not of so much importance, because not only do the strains on it keep it in the proper form, but the weight of the parts has a tendency to cause them to hang in a perpendicular position. This is especially the case if the bridge seat is at the top chord, that is, if the top chord rests on the abutments or piers. But in order to be secure against the most severe storms, it is always best to be sure that the lateral bracing even at these points is sufficient for that purpose.

The lateral bracing of bridges is often neglected because its importance is not realized. Frequently it does not extend to the abutments or piers of the bridge, and if it does is not securely attached to them. When this is the case, it is possible for the bridge to fail, from either of the causes named, at the point at which the bracing ends. The general tendency of all things pertaining to human affairs is to get out of order. This applies especially to the lateral bracing of bridges. Unlike the main trusses it is not tested every time a train crosses the structure, but its most useful purpose may be to resist a hurricane once or twice in a lifetime. If it is in good condition when the hurricane comes, the bridge will stand, but if it has been neglected the structure may be destroyed. The connections of all the parts should therefore be examined, and, as stated, it should be observed whether it is continuous to the abutments or to the portal or end posts at the top chords of a through bridge.

PONY TRUSSES.

The class of bridges in which the lateral bracing is perhaps oftenest deficient is what are called "pony

trusses," that is, trusses which are not high enough to put the transverse bracing between the top chords across and over the track. In these the top chord should be made wide, so as to resist lateral flexure or bending. Besides this, the floor-beams should be extended outside of the trusses so far that diagonal braces can be carried down from the top chord or from the posts and attached to the floor beams. Many of the older pony truss bridges are in this respect very insecure.

TRANSVERSE BRACING.

The point which is most neglected in bridges, however, is what may be called the transverse bracing. By this is

meant bracing intended to hold the sides, top and bottom of the structure in a rectangular form. Thus let fig. 1 represent a transverse section of a bridge. Now unless there is bracing to hold it in this shape there is nothing to prevent it from assuming a rhomboidal form, as shown in fig. 2. This can be prevented by the use of angle braces, as shown in fig. 3. It is best, especially in long span bridges, to put these at the top and bottom, but in smaller bridges, if they are used at only one point, they should be attached at the floor, in preference to putting them above in through bridges or below in deck bridges. When these braces are used they should always be carefully examined to see that they are in good condition, and that their con-

nections are secure. When bracing is attached to cast-iron lugs, an inspector should always be suspicious of them partly on account of the treacherous character of the material, and partly because such lugs are so often badly proportioned. When the latter is found to be the case, some alteration should be made to provide against the weakness.

Transverse strength is sometimes provided by the construction of strong portals at the ends of a bridge. These are at the same time made ornamental, but even when these are as strong as practicable, it is best to use diagonal corner bracing at each of the posts, or at suitable distances, so as to keep the structure in the proper form.

DEFLECTION.

A common idea prevails that the strength of a bridge is in inverse proportion to its deflection; that is, that the less the deflection the greater the strength. Instead of this being true, the reverse may be the case. All material, whether of wood or iron, will stretch under strains of tension, or be compressed by the opposite strains. Within the proper limits this is no injury to the material or the structure, but in a properly constructed bridge the stretching and the compression, and consequent deflection, can be calculated, and the results thus determined with great accuracy. It of course is not true that because a bridge does deflect it is therefore strong, and there may be an excessive amount of deflection which will indicate the weakness of the structure; but it is equally true that it is not necessarily strong because it deflects little. Any irregular deflection, that is, much at one time and little at another, or much with a train in one position on the bridge and little when it is in another position, indicates that there is something wrong. When this is observed, unless the cause is apparent, it is best to consult a bridge engineer. In fact, whenever an inspector discovers anything wrong, and is unable to discover its cause, he should call in a competent engineer who has made such subjects matters of especial investigation.

WOODEN BRIDGES.

In wooden bridges the decay of the material must of course always be a subject of especial solicitude. It is difficult to give any directions, in articles of this kind, which would be of much assistance in determining the condition of timber. Practical experience in working timber will teach much more than can be conveyed in print. An auger is perhaps the best instrument to test the internal condition of timber, and paint the best preventive of decay, In using an auger, however, to determine whether bridge timber is sound, care should be taken not to use it where the hole bored will weaken the structure, and after boring the hole should always be plugged up to exclude water, which would promote decay.

RUST AND PAINT.

To protect iron bridges from rust, which is only another form of decay, paint is the great preventive. Neglect in applying it results at once in a process of slow destruction. As painters are obliged to go over every square inch of the surface of a bridge, they should have some instructions about observing defects, especially flaws or cracks in castings, and they should be ordered to report them. In this way an inspector's attention may be called to serious defects which would otherwise escape his attention.

FOUNDATIONS AND MASONRY.

Several very serious accidents have recently occurred from the washing out of the foundations of the abutments of bridges. In order to secure safety it is imperative that the masonry of the abutments and piers should be carefully examined. Any crack or unequal settlement is conclusive evidence that the masonry is in bad condition. It is almost impossible, however, to give any directions or rules for detecting defects in the foundations of the piers or abutments, as each case must have a rule for itself. Good construction in the first place is the only adequate means to provide security, and experience the best guide in detecting bad workmanship.

DAMS.

A serious accident occurred a few years ago in New England, which was caused by the washing away of a railroad bridge by the breaking of a mill dam a short distance above it. Its lesson is sufficiently obvious without pointing out the necessity of a bridge inspector's satisfying himself of the security of dams which might endanger a railroad bridge near them.

OVERHEAD BRIDGES.

It is also important that the security of overhead bridges which cross a line of railroad should be observed. Often these are not owned by the railroad company, but nevertheless its traffic would be seriously imperilled by the falling of such a structure on its track. Often common road bridges which cross railroads are absurdly weak, and usually are examples of the most fatal "tin-pan" engineering.

SAFETY CHAINS

There is another matter which is quite apart from the construction of bridges, but upon which their safety is often vitally dependent. The safety chains on car, engine and tender trucks are referred to. The object of such chains is to prevent the trucks from turning around crosswise of the track when they get off the rails. Attention has repeatedly been called in these pages to the fact that if a truck gets off the rails, it will run a long distance on the cross-ties without serious danger, so long as it remains in line with the rails. If, however, it gets turned crosswise of the track, then there will at once be a crash if the train is running at all fast. Now it is true that with a proper floor system, provided with the requisite guard timbers and guard rails, a truck, even without safety chains, would, if it was derailed, be kept in line by the guards; but if any portion of train ran off the rails before it reached the bridge, the danger then would be that a part of it would run against the portal or end posts of the bridge, and thus demolish the whole structure. If a car in the train was off the rails, it might destroy the bridge after a portion of the train was on it. It is very rare, indeed, that any portion of the construction of a bridge is so utterly bad and the strength so insufficient as that of safety chains on cars often, if not usually, is. It seems as if a large proportion of the master car-builders were incapable of either calculating or forming any idea whatever of the strength of safety

chains or their attachments or the strains which they must resist. They seem to be put on, very often, without any regard to their strength. Now if bridge inspectors would call attention to the insufficiency of these attachments, they would add to the security of the structures under their own charge, and also do much to increase the safety of travel over the whole line of their road.

BAD CONSTRUCTION.

But even the most careful inspection will not atone for, or cure, radical defects in the first construction. If the quantity or quality of material used is not sufficient to resist the strains to which the bridge is subjected, or if the strains have not been properly calculated, it will not be strong enough. The only true safeguard against such causes of weakness is to employ competent engineers to design and construct the bridges.

SUPPLEMENTARY SUGGESTIONS.

These articles have extended to greater length than was at first intended. It is proposed to supplement them with suggestions from practical men, and, with that end in view, we invite communications from any who have had practical experience either in the construction or care of bridges. We especially want suggestions from that class concerning the defects of wooden bridges, and of masonry and its foundations—subjects which need elucidation. Several communications have already been received, and others are promised. Any one who has observed a cause of weakness in bridges not pointed out in these articles, or any other valuable fact or observation relating thereto, is requested to communicate it.

FALLACIES AND AXIOMS.

These articles will be finished by the statement of several fallacies into which railroad men are prone to fall, and axioms which it would be well to observe.

Fallacy I. That because there are no defects known in a bridge, therefore it has none.

Fallacy II. That because a bridge never has fallen, it never will.

Axiom I. It is always safe to have a bridge *too strong*, and always dangerous to have it *too weak*.

Axiom II. The greatest strength of a bridge is only equal to that of its weakest part, therefore bridge inspectors ought to be untiring in trying to find the weakest parts.

September Earnings and the Future Prospect.

September earnings are reported in our table for thirty railroads, having this year 16,373 miles of road, which is about 21 per cent. of the total in operation in the United States. These roads with a mileage 4¼ per cent. greater than last year earned 10½ per cent. more during September, and their average earnings per mile rose from $589 last year to $624 this—an increase of 6 per cent. When it is remembered that every one of the eight months previous showed a decrease, as compared with last year, it is easy to understand how encouraging this change is. Last year September was not an especially unfavorable month, so far as gross earnings were concerned. The thirty roads whose returns were given in our table then, including most of those reporting this year, showed an increase of 2.2 per cent. as compared with 1875. Through rates were then extremely low, and the grain movement was not nearly so large as it has been this year, but the Centennial passenger traffic was then at its height, increasing materially the receipts of some of the roads reporting. This heavy Centennial traffic, from about the middle of August to the middle of November, should be remembered in comparing earnings. While the passenger earnings of the entire year were not made larger on many lines by the Centennial traffic, the passenger earnings of that single quarter were greatly swelled by it on many roads, especially in the East.

Of the thirty roads reporting for September this year, 21 show some increase in earnings, and in some cases the increase per mile is very large, as 100 per cent on the Burlington, Cedar Rapids & Northern, 82½ on the Chicago, Milwaukee & St. Paul, 22½ on the Illinois Central (all its lines: it is nearly 50 per cent. or its Iowa lines), and more than 10 per cent. on eleven other lines. The decreases are generally smaller, and the largest (as in the case of the Central Pacific) are chiefly due to the addition of new lines with very light traffic to the system worked in 1876.

For the nine months ending with September we have reports from 29 roads, including about twenty-five of those reporting for September separately. These had this year 15,850 miles of road, or a little more than one-fifth of that now in operation, and nearly 5 per cent. more than they had last year. Their total earnings were less this year by 2.2 per cent., but the decrease in earnings per mile was much greater, from $4,536 to $4,228, on 6¾ per cent. Of the 29 roads reporting, 16 show an increase, but the increases are in most cases small—23 per cent. on the Texas & Pacific and 14½ on the St. Louis, Iron Mountain and Southern being the only exceptions—the only roads with increases as great as 10 per cent. On the other hand there are many large decreases—seven of more than 10 per cent.

This would be very discouraging but for the fact that the fall business is reducing the decreases. The first seven months of the year showed a decrease of 11.4 per cent. in the earnings of the roads reporting; the first eight, a decrease of 9.1; the nine months here reported, 6 8.

As we have often said, however, the number of roads reporting, especially of important roads, is so small that it is not safe to make a general induction from their business alone. There is no New England road in our table, few Southern roads, no anthracite coal road, no trunk line east of the Lakes and Pittsburgh. We have to depend upon general observation and current reports of ordinary business to form a conclusion as to traffic and railroad earnings in many parts of the country. The heavy grain traffic, it is true, benefits a very large number of roads, directly and indirectly; but there are many which are little affected by it. The anthracite roads, for instance, can hardly attain even tolerable prosperity without a large demand and remunerative prices for coal. This year they have carried considerably more than last, but at this time they are carrying less; and though there is likely to be a quite large consumption during the year now nearly expired, no one pretends that the prices have been remunerative; and though it is reasonable to anticipate a continuance of a good demand, and even some increase in it, the future of prices seems as doubtful as ever. The Southern roads depend very largely on cotton, and as yet it seems uncertain whether the crop is large or only moderate, estimates varying from 4,000,000 to 4,500,000 bales, the latter being about the same as last year's. The one thing certain is that the crop is very late, much later than last year, and in consequence the quantity marketed has been much less than last year. Reports indicate, however, that there has been a larger rather than a smaller movement of merchandise *to* the South, and this is an indication of prosperous times and a good traffic later in the season. The New England roads do not profit much directly by the grain movement, the coal movement or the cotton movement; but their traffic is very largely affected by the general prosperity of all the rest of the country. In the absence of reports of earnings it is gratifying to hear reports that the New England roads are now generally doing a satisfactory business. The well informed Springfield *Republican* says that the Boston & Albany (which, however, has the business of a trunk line as well as of a New England road is now making earnings at such a rate as to indicate that it will be able to resume 10 per cent. dividends. Nearly everywhere there are indications of fair amount of traffic, in many places of a very large traffic. This, however, is only one of the elements of good earnings; the other is remunerative rates, the lack of which made the enormous business of the trunk lines last year unsatisfactory. But there probably never was a time when there was less probability of a war of rates. It is true that rates are low and are likely to remain so. But they are not so absurdly low as they have been often and for much of the time during the past two years. They leave a margin of profit, with the present reduced working expenses; and, so far as we can see now, they are not likely to be reduced recklessly. It is true that in railroad affairs we cannot see far, and that trouble may break out at short notice. We can only say that the condition of the minds of those who control these matters seems now exceptionably unfavorable to any such disturbance.

The Hannibal & St. Joseph.

The Hannibal & St. Joseph Railroad was not many years ago the most profitable line west of the Mississippi River. Not only was it the only road by which access could be had to Kansas from Chicago, but it had almost all North Missouri to itself. That country was not then and is not now very thickly settled, it is true, but enough so to afford a good traffic and liberal support to the 300 miles of the Hannibal & St. Joseph Railroad. And, whatever may be said of the management, this company is not one of those whose misfortunes can be charged to an increase of obligations through the construction or leasing of unprofitable branches and extensions. It has at this day very little road that is not indispensable to it. The original trunk line of 206 miles from Hannibal & St. Joseph would have been comparatively valueless but for the branch of 15 miles, which gave it a second terminus on the Mississippi River, at Quincy, and a connection with the Chicago, Burlington & Quincy Railroad, which for many years was its chief outlet to the East. What is known as the Kansas City Branch, 53⅛ miles long, became almost as soon as it was completed the true main line, Kansas City by that time having become the true traffic centre for Kansas, where a great immigration and rapid railroad building were causing extraordinary activity and contributing a large traffic to railroads east of the Missouri. This branch may have cost too much, but no one can say that it was not needed or that it is not now needed. The most recent addition to the road, a branch 22 miles long, from St. Joseph to Atchison, probably is not very valuable, though it gives access to the traffic of a considerable mileage of railroads. This connection could have been had on easy terms from existing roads. Altogether the road is well placed, both for local and through traffic, more so probably than any other railroad in North Missouri, being far enough north to serve excellently as an outlet from Kansas and the country on its line to Chicago, and not so far north as to prevent its forming part of a short through line directly to the East, by way of Indianapolis, etc. It can be used also as a line to St. Louis, but is not a short route for through Kansas traffic to that city, and it is for its interest to have the Texas and Colorado cattle and the Kansas products shipped to Chicago or directly to the East rather than to St. Louis—as much or most of it is shipped to this day.

When the Kansas immigration was active and this road was often crowded with business, it was counted one of the "Joy roads," Mr. James F. Joy, of Detroit, being President and director of its management, as he was of the Michigan Central and the Chicago, Burlington & Quincy, and a number of Boston capitalists holding a controlling interest in its stock. The Joy management was co-incident with the prosperous period in the history of the Hannibal & St. Joseph, and there are those, probably, who will conclude that the company's misfortunes are the result of the mismanagement of his successors, of whom there have been many, including some "financiers" who were never suspected of skill in legitimate railroad management, though they may have been suspected of something worse.

The change of control occurred about in this way: After the Kansas City Branch was completed the earnings of the road, chiefly from Kansas immigration, suddenly became very large, and for two or three years large dividends (10 per cent., we believe,) were declared. The stock had been very low, but the dividends attracted the attention of a body of New York city politicians and others who had been accumulating capital through the Tweed ring, by plundering the Erie Railway and otherwise, and these people were anxious to secure a good and safe investment for part of their spoils. They began to buy freely, and finally bid up the stock to prices so high that the Boston men let it go quite freely. The latter were owners of other railroads through which, with a little new construction, they could give the Chicago, Burlington & Quincy, a Kansas City connection, which probably made them more willing to sell their stock when they were 1871, the Joy directory was re-elected, somewhat to its own offered more than it was worth. However, at the election of surprise, it is supposed. But during the next year (when the earnings were very large), the price of the stock was run up very high, and the Boston men sold out almost entirely to the New York party, who chose their own directory in the election of 1872. The Boston party had kept the road as long as it had large earnings. They then sold it at a high price, and it has never earned a dividend since, and only one year has it earned as much as the interest on its present bonded debt.

However much the misfortunes of the road may have been aggravated by the character of some of its recent managers, they cannot be said to have caused them. A glance at the map as it was in 1868 and is now would suffice to show that a decrease of profits was to be expected from the changed condition of things. Nine years ago, as we have said, there was but one railroad from the Missouri to the Mississippi north of the Missouri River and south of Central Iowa. Moreover, in this territory, 200 miles square, there was very little other railroad of any kind, and only a few miles which in any way competed with the Hannibal & St. Joseph. At that time, it is true, the population west of the Mississippi was much smaller than now, but it was just then going forward, and giving a passenger traffic westward probably greater than there is now, when some 1,500 more miles of railroad have been built in North Missouri, and there are four or five lines from Chicago to Kansas City instead of one. Three great Chicago companies which command most of the traffic between that city and Kansas and a very large part of the whole business between Kansas and the East are interested in diverting business from the Hannibal & St. Joseph, though one of them continues its chief and almost sole Chicago outlet.

With such a change in the circumstances, it is not strange that the Hannibal & St. Joseph, however managed, should find it impossible to keep up its old rate of profits. Its gross earnings have largely decreased, and the reduction of working expenses, large as it has been, has not sufficed to prevent an enormous shrinkage in the net earnings. Since the completion of the Kansas City Branch the gross earnings, working expenses and net revenue have been as follows, as recorded in Poor's Manual, the fiscal years ending with August of the years named:

Year.	Passenger.	Freight.	Total.	Expenses.	Net earn.
1868....	$826,242	$1,237,041	$2,184,168	$1,371,652	$812,516
1869....	1,154,632	1,565,129	2,841,997	2,078,184	763,814
1870....	1,258,225	1,882,071	3,340,225	2,240,558	1,099,667
1871....	1,101,395	1,765,754	3,104,969	2,015,935	1,089,035
1872....	816,310	1,465,517	2,484,671	1,814,141	670,530
1873....	650,650	1,176,153	2,029,068	1,780,480	248,587
1874....	601,246	1,047,260	1,912,955	1,435,133	477,832
1875....	522,851	954,116	1,748,284	1,361,549	386,735
1876....	505,982	1,139,771	1,864,065	1,393,812	470,254
Sep. 1 to Dec. 31, 1876....	194,942	428,534	713,764	498,212	215,552

Thus it appears that the company's business culminated in 1870, when the gross earnings were $3,340,000, and the net $1,100,000, or at the rate of $12,145 gross and $4,000 net per mile—more than is now made by any of the roads from Chicago westward which still pay 8 per cent. dividends. But this prosperity only lasted two years. In 1872 the net earnings were but $2,440 per mile, or 61 per cent. less than they had been only two years before.

The first column of figures is a pretty fair indication of the manner in which the company's earnings were swelled by the enormous Kansas immigration. Passenger earnings were $4,200, $4,575 and $4,000 per mile in 1869, 1870 and 1871, respectively. They have decreased constantly since, and for the last year reported were but $1,840. Here is a decrease of 60 per cent. in the traffic which on the average American road varies very little—which on such a road as the Michigan Central has not changed 10 per cent. (in amount) since the war, until the Centennial year.

The fact is, the large business of the earlier years is more phenomenal than the small one of the later years. Very few railroads in the West make $4,000 per mile yearly from passenger traffic. The exceptionally prosperous Chicago, Burlington & Quincy made a little less than $2,000 a mile from this traffic last year, the Chicago, Rock Island & Pacific less than that, and the Chicago & Alton, with its line between the two largest cities of the West, only $1,800.

It is not true, of course, that the decrerse of passenger earnings is due solely to the falling off in the Kansas immigration. That phenomenon is rather an explanation of the fact that such a road, with no population to speak of beyond it, should have secured such exceptionally large earnings in 1869-72. Since that time there has been a considerable population in Kansas to support the road, and there has been some growth in the country directly on its line. The immigrant traffic has fallen off, but the ordinary passenger movement that exists between one population and another has been almost created. But, as we have said, however large that may be, and however large the Kansas freight traffic unquestionably is, the Hannibal & St. Joseph now has to share it with five or six competitors, and in order to get any of the freight it must carry it at prices which in 1869 would have been regarded as ridiculously inadequate on the trunk lines with the best appliances and the heaviest traffic.

The company has, however, an unduly large capital account. It has outstanding $51.919 stock and $31,692 bonds per mile of road, or $83,611 in all. Compare this with the $42,500 per mile which represent the Chicago, Burlington & Quincy, with its exceptionally excellent roads and equipment. The latter has always paid 5 per cent. dividends half-yearly until the last half-year. But its funded debt is but $21,200 per mile of road, against the Hannibal & St. Joseph's $31,700. It requires less than $1,500 of net earnings per mile to pay the interest charges of the Chicago, Burlington & Quincy; $2,400 is needed for the Hannibal & St. Joseph.

According to the reports, it would appear that the latter has not earned its interest for many years—not since 1872. The net earnings per mile since that year are reported as follows for the successive years: $906, $1,747, $1,409, and $1,712. As the company has not issued annual reports of late years, it is impossible to explain this. The company had a large land grant, with the proceeds of which it has retired a land-grant mortgage for $5,000,000; but we find nothing to show whether there has been an additional income from the lands applicable to the payment of interest on other bonds. The figures reported show that during the four years ending with August of last year the total net earnings were but $1,583,400, while the interest payable (and paid, as it appears), meanwhile, was $2,640,000.

There has been since 1872, however, an increase of $5,000,000 in the common stock of the company. Of this $2,000,000 was issued to pay for the construction of the Atchison Branch (which ought not to have cost one-third of that sum), but we are unable to find anything concerning the disposition of the proceeds of the other $3,000,000. It has been suggested that they have been used to eke out the net earnings in paying the yearly interest since 1872.

The management which succeeded to the Boston board in 1872 has itself been succeeded or greatly modified by another party, now in power. The most that we can say of them is that they have vouchsafed a plentiful lack of information to their stockholders and the public. No annual report has been published since 1872, and the officers have apparently conducted the company's affairs as if they thought it was none of the stockholders' business. The company has not yet, we believe, failed to meet any obligation, but the recent negotiation of a trifling loan on exorbitant terms shows that its affairs must be in extraordinarily bad condition, or else there is some scheme on hand for wrecking the road. It is not easy to see how it can be kept out of bankruptcy. Last year (1875-76) 40 per cent. more than the net earnings were required to meet the interest, and twice in the past four years the net earnings have been less. There is a fair chance at least that the net earnings will, in course of time, exceed the present interest, but the value of the stock is exceedingly problematical, and at best only a very small income on the preferred can be had for years to come. The debt is too large and the rate of interest on it is too high for a road in its situation.

The Master Car-Builders' Monthly Meetings.

These meetings have been held for several years, and although of a very modest and unpretentious character they have called out more interesting debate and valuable information concerning the practical management of railroads than perhaps any similar meetings ever held.

They are managed in the simplest manner possible. They are open to all who choose to attend, and any one who has anything to say can say it. It is to be regretted that there has not been a larger attendance of railroad officers; if those within reach of New York would take part, it would soon become possible to enlarge the scope of the subjects which are considered, and in this way widen very much the usefulness of the meetings. It is the desire of those who have conducted them to impress upon all railroad men that they are invited to attend, and from the experience of the past it seems certain that it would be a source of profit as well as of entertainment to nearly all classes of railroad officers to be present.

The first meeting of the season was held last week, mainly to prepare for the future meetings. For discussion at the next meeting, to be held Nov. 15, the subject chosen is "The Annual Rate of Depreciation of Railroad Cars," and Mr. Leander Garey, Superintendent of Cars of the New York Central & Hudson River Railroad and President of the Association, is invited to open the discussion.

The subject selected is a very important one, and about which there is very little exact information procurable. Like nearly all other subjects of this kind, in first looking at it it is discovered very dimly; but gradually, as the light of accumulated information is shed on it, we see it more distinctly. It is a matter which enters very often into disputes between railroad companies, and a correct understanding of it is of immediate pecuniary importance. If the class of people who are quite ignorant of the subject but who always imagine that they can evolve solutions of such matters directly out of their inner consciousnesses would only come and listen and tell what they know, if they know anything, doubtless they would find that by hearing such a discussion they would learn some things which are worth knowing. The class of people we have in mind are superintendents and their clerks, accountants, auditors, etc. If these, with the master car-builders and master mechanics, should attend, it would be possible to make these meetings what probably few now imagine they could be made, but which it seems quite practicable to bring about.

Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads as follows:

Waynesville, Port William & Jeffersonville.—First track laid from Allentown, O., west by south to Port William, 11 miles. It is of 3 ft. gauge.

St Paul & Pacific.—The *Glyndon Cut-off* is completed by laying track from Breckenridge, Minn., north to Barnes, 22 miles.

Western of Minnesota.—Completed by laying track southward 36 miles to Watab, Minn.

Sabine Pass & Northwestern.—The first track is laid from Lawrence, Texas, south to Kauffman, 12 miles. It is of 3 ft. gauge.

This is a total of 81 miles of new railroad, making 1,629 miles completed in the United States in 1877, against 1,770 miles reported for the corresponding period in 1876, 920 in 1875, 1,242 in 1874, 2,955 in 1873, and 5,312 in 1872.

A Scarcity of Cars on the trunk lines has been complained of recently, but it has been charged that the complaint is a false one, because the trunk roads last year were carrying about twice as much grain, and have as many cars now as then. This charge indicates a woful lack of knowledge on the part of those making it. Not only may there be a greater demand for cars for other freight than grain, but, in spite of the much heavier grain movement over the trunk lines last year, there has been a much greater demand for grain cars this fall. It seems to have been assumed that the trunk lines are limited to their own cars. This is the case only when the cars of their tens of thousands of miles of connecting roads are fully employed at home. This year they are; last year they were not. Except for a few weeks last fall the Northwestern roads had freight cars to spare, which they were only too glad to send over any connecting railroad which would pay the regular mileage charge for their use. Now the Northwestern roads, almost without exception, find full use for their cars at home, and most of them have needed more than they could get.

The Cost of the Railroad Strikes, in the State of New York alone, simply for the pay, subsistence and expenses of the militia called out to preserve order, is reported by the Adjutant General to have been about $250,000. Add the damage to property by delays and malicious destruction and the total will amount to something formidable, and that in a State where the troubles were less serious and lasted a shorter time than in two or three other States. The bill in Pennsylvania must have been many times as great, and adding New Jersey, Maryland, Ohio, Indiana, Illinois and Missouri, the total would make a somewhat formidable figure even in a war budget, to say nothing of the income or even the capital account of a great railroad company.

Contributions.

Comparative Performance of Fairlie and Consolidation Engines.

Williamsport, Pa., Oct. 22, 1877.

To the Editor of the Railroad Gazette:

There is no question of more importance to railway engineers to-day than the one discussed by Mr. Fairlie in his letter to you published in your issue of Oct. 19.

Heavy freight engines are needed now not only to climb steep grades, but also to haul trains half a mile long on level lines. Mr. Fairlie occupies two or three columns in trying to convince your readers that a Fairlie engine will haul more cars than a consolidation engine with less adhesive weight. I do not suppose any locomotive engineers will care to dispute such a point with him. It may be taken for granted that any engine, consolidation or Fairlie, can be made to haul loads in proportion to the relative weights on the driving wheels. The proper dimensions of cylinders and boiler can be given to any engine.

The difficulty in designing a locomotive for heavy work has been to get sufficient flexibility; for to do heavy work it is necessary to have great adhesive weight, and to avoid putting too much on each wheel it is necessary to increase the number of driving-wheels. Engines of the ordinary English type with six wheels coupled will not pass round the curves commonly found on American and Colonial railways, and even six-wheel-coupled engines are not powerful enough to do the work demanded of freight locomotives now.

Mr. Fairlie has designed an engine in which the adhesive weight is distributed over a sufficient number of wheels to prevent damage to the track, and which is sufficiently flexible to pass around the sharpest curves found in practice; Mr. Alexander Mitchell, now Superintendent of the Lehigh Valley road, also designed an engine which meets the same practical requirements, and these two types of engine having been brought very prominently before the public, the one by the persistent advertising of its inventor, and the other through its own merits, it is of interest to know which can most economically do a given amount of work.

The cost of doing work, as affected by the motive power, may be classed thus:

Cost of fuel consumed,
Cost of repairs to locomotives,
Wages of train hands, including engineer and fireman,
Interest on first cost of engines.

Excessive damage to track if caused by either type of engine would also have to be considered.

First, then, cost of fuel. It will be hard for Mr. Fairlie to convince locomotive engineers that he can build an engine with two sets of cylinders and working gear which will haul a given train with as small a consumption of fuel as one with but one set of cylinders. He will have to produce unquestionable proofs of the fact based on performance in actual service during a long period before people will believe him, for all experience shows that one large engine will do work more cheaply than two small ones. And it would be equally difficult for him to convince us that a locomotive combining two complete engines was more economical to repair than one of ordinary design. It may be taken as certain that in economy of fuel and repairs, the consolidation engine will be found far ahead of the Fairlie. The wages of train hands will be the same for both engines, for we assume that both have the same adhesive weight, and therefore pull the same number of cars. The item of interest on first cost may be quite worth considering, when the difference between the two kinds of engine is so great as it is between the complicated Fairlie with double the machinery of an ordinary engine and the simple consolidation engine. What the difference in cost of each engine would be perhaps Mr. Fairlie will tell us, and for the purpose of comparison I will quote the price of the last two engines delivered to the Pennsylvania Railroad from the Baldwin works. These two engines have about 79,000 pounds adhesive weight, and they cost, with tenders complete, $11,000 each. Now, will Mr. Fairlie tell us for what price he can get some English builder to turn out such engines of his design as he can guarantee will do the work which these consolidation engines perform?

An important point in the consideration of the cost of equipment is, that if the complication of Mr. Fairlie's engine necessitates more frequent repairs than would be required by engines of more simple construction, it would take a larger number of his engines to do a given amount of work.

The question of damage to track is not an easy one to decide. Very careful inquiries were made by our General Superintendent to ascertain if any increased cost in maintenance of track could be found on those portions of our line where consolidation engines have been running about six years as pushers, and where for every freight train passing over the line a consolidation engine goes over the rails twice, but there is nothing to show that they damage the track more than would be done by ordinary engines. Nor would practical experience lead us to expect any bad results from their use. Riding on the footplate of one of them, the motion is found to be very easy, even at a speed of 30 miles an hour. They pass sharp curves without any appreciable strain.

This comparison of the two engines is only fair, if the tractive force developed in practice bears the same proportion to the theoretical tractive power in each system. I send you a table prepared from information easily obtainable by any one, from which it appears that the advertisements of the Fairlie engine do not show any superiority for it in this respect. I sent this table to London *Engineering* some months ago, with a letter to them on the same subject; but the matter does not appear to be of much interest to them. I suppose they do not care to advertise the great superiority of the American type of engine for all railways which are less straight and substantial than their best home lines; for it must be remembered that the consolidation is the natural product of the application of the ordinary American principles in locomotive design, while some contrivance like Mr. Fairlie's would naturally be attempted by English builders, whose engines could not be kept on the track if more than four wheels were coupled, on cheap railways such as are often desirable in the colonies, in India and in South America.

Finally, if practical success is any test of value, there can be no question as to the comparative merits of the two systems. Mr. Fairlie has worked hard, written uncessingly, and traveled extensively to present the merits of his system to the railway world. He has persuaded Government inspectors, titled commissioners and some engineers to sign testimonials in regard to the performance of his engine. He has had the support of the most powerful and widely read engineering journal in the world, and yet where are his engines to be found? Scattered in ones and twos in various countries, and on various lines. What important railroad has adopted the system? Is there one good English road which uses them at all? Is there any road in the world which has twenty of them, or is there any road which has had five years' experience with ten of them and intends to order ten more?

Now what is the history of the consolidation engine? It is safe to say that the designer of this engine has never written one line, nor traveled one mile to persuade people that he had produced a good thing. There is no profit in them, for him, as he has no patent for the system. He was thinking only of providing for the gigantic coal trade of his line when he made his design, and having produced the engine which he needed was satisfied to let it alone. Soon, however, every one heard of the tremendous coal trains which were being hauled up the heavy grades and round the sharp curves of the Lehigh Valley, and orders poured in on the builders who were first entrusted with carrying out Mr. Mitchell's designs. I venture to say that the Baldwin Works have never been without orders for consoli-

dation engines since the success of the first one was established. They have turned them out by the dozen, of all weights and to suit all gauges. Of course, other makers are also following suit, and the most important railroads have scores of these engines running. The Pennsylvania Railroad has adopted them as its standard freight engines, and they are universally recognized by those who have had any extended experience with them as the most advanced type of freight locomotive for heavy service.

I do not wish it to be inferred, from what I have said, that I have no sympathy with English manufacturers, or their productions: on the contrary, I consider that I am doing a patriotic service to English capitalists if I point out to them the loss which they incur by investing their money in the channel in which it is being presently employed; for it is an undoubted fact, that the American system, by its superiority, is fast

COMPARATIVE STATEMENT OF THE PERFORMANCE OF LOCOMOTIVES OF FAIRLIE AND AMERICAN TYPES.

RAILROAD WHERE OPERATED.	Cylinders. Number	Cylinders. Dimensions (in inches)	Drivers. Number	Drivers. Diameter (in inches)	Weight on Drivers (in pounds). Total	Weight on Drivers (in pounds). Each	Actual performance. Weight hauled in gross tons, including engine and tend'r and tank and lading	Actual performance. Grade, up which hauled, in feet per mile	Actual performance. Combined with curve of radius of (feet)	Resistance overcome per ton of engine and train (in pounds) due to: Grade	Curve	Friction	Total	Tractive power (in lbs.). At Rail. Calculated at 90 lbs. pressure per sq. inch of pistons	Tractive power (in lbs.). Actual. Develop'd by performance stated	Percentage. Actual less than calculated tractive power	Percentage. Actual more than calculated tractive power
Fairlie Locomotive. Southern & Western N. G Ry. of Queensland... Gauge, 3½ ft.	4	11 × 18	8	30	62,720	7,840	148.	105.6	....	44.6	....	10.	54.6	10,052	8,110	19.3	....
Baldwin Locomotive. Denver & Rio Grande Ry. of U. S. A..... Gauge, 3 ft.	2	12 × 16	6	36	33,000	5,500	161.3	75.	....	32.	....	10.	42.	5,760	6,774.6	....	17.6
Baldwin Locomotive. Mineral Range R. R. of U. S. A..... Gauge, 3 ft.	2	12 × 16	6	36	33,000	5,500	83.2	211.	....	89.6	....	10.	99.6	5,760	8,286.7	....	43.8
Baldwin Locomotive. East Broad Top R. R. of U. S. A..... Gauge, 3 ft.	2	14 × 16	8	38	44,000	5,500	104.8	140.	338	59.4	9.3	10.	78.7	7,840	8,247.76	....	5.2
Baldwin Locomotive. Toronto, Gray & Bruce Ry. of Canada..... Gauge, 3 ft.	2	16 × 20	8	41	50,000	6,250	305.8	88.	573	37.3	5.5	10.	52.8	11,239	16,046.24	....	42.7
Fairlie Locomotive. Festiniog Railway of Wales..... Gauge, 1 ft.	4	8½ × 13	8	28	44,800	5,600	206.	62.11	297	26.3	10.7	10.	47.0	(150 lbs. steam.) 9,480 (90 lbs. steam.) 17,280	9,682.	....	2.1
Baldwin Locomotive. Pennsylvania R. R. of U. S. A..... Gauge, 4 ft. 8½ inches.	2	20 × 24	8	50	79,400	9,925	2,462.	level.	....	....	....	10.	10.	17,280	24,620.	....	42.4

making its way to those markets of the world which naturally belong to Englishmen to hold. They have entirely lost the locomotive trade of Canada; they have only a partial foothold in South America; Australia has begun to order American engines; and yet the railroads in these countries have been largely built by English capital and controlled by English officers. India would undoubtedly largely order American engines were it not for the conservative influence of Government officials.

You will therefore understand, Mr. Editor, that in saying what I have in regard to Mr. Fairlie and his system I am animated by no personal motives whatever; but I could not allow the statement that Mr. Fairlie's engine had no rival to go into print in such an influential and wisely-read paper as the *Gazette* without taking exception to it in the manner I have done.

HOWARD FEY.

The Inspection of Bridges—Strains on Counter Bracing.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Permit me to suggest a correction to your article on "The Inspection of Bridges" in number dated Oct. 19, 1877, in which, referring to the fact that counter braces are not strained when the bridge is unloaded or uniformly loaded, it is stated that if the inspector should tighten these braces under such conditions "the effect will be that some of the members will be placed in a state of tension before the bridge is loaded, *which will have the effect of increasing the strain that the members must bear by an amount equal to the tension of the counter rods.*" (Italics not in original.)

It is submitted that the strains induced in main members by the initial tension of the counter rods is *not* added to that produced by external loads; the latter simply reduce the tension of the counters so that strains due to the loads are substituted for—not added to—those induced by the counters. Many bridge-builders put their bridges under tension with the counters at the outset, thereby reducing not only the deflection but the destructive action due to vibrations and to movements in the joints. This is accomplished without any additional strain on main members, as is popularly supposed.

It may be laid down as a general rule that the strains on a structure due to internal tension (or those induced by the simple tightening of the members one upon another as distinguished from those arising from the transfer of an external load from one point to another) are not increased by the action of external loads inducing strains of less intensity. This distinction I find has been neglected by some writers in analyzing roof trusses.

The subject is of so much interest that I take leave to add, under another heading, a simple example of an old problem involving the same principle.

STRAINS ON STEAM-CHEST BOLTS.

I would suggest that many of your contributors will find it interesting to send you solutions of the following problem:

Suppose a steam-chest 6 in. square inside has its cover held on by four bolts, screwed down so as to bring a uniformly distributed strain upon the joint of 7,200 lbs., when there is no pressure in the chest. What will be the strain on the bolts when steam is admitted to the chest at a pressure of 100 lbs. per square inch?

CHAS. E. EMERY.

No. 7 WARREN STREET, NEW YORK, Oct. 20, 1877.

[We prefer publishing the above without comment for the present, and will leave it for discussion by correspondents of the *Railroad Gazette*.—EDITOR RAILROAD GAZETTE.]

General Railroad News.

ELECTIONS AND APPOINTMENTS.

Albany & Vermont.—At a meeting held in Troy, N. Y., last week, the following directors were chosen: E. T. Gale, J. M. Warren, James Forsyth, Wm. H. Hartt, C. W. Tillinghast, John B. Gale, B. H. Hall, C. L. Tracy, T. W. Lockwood, John L. Thompson, George M. Tibbits, George H. Cramer, Thomas White. The road is leased to the Rensselaer & Saratoga and sub-leased to the Delaware & Hudson Canal Company.

Allegheny Valley.—Mr. Frank E. Nettleton, formerly Northern Freight and Passenger Agent at Buffalo, has been appointed Assistant General Freight Agent, with office in Pittsburgh. The agency at Buffalo has been discontinued.

Atchison, Topeka & Santa Fe.—It is reported that Mr. W. B. Strong, for about two years past General Superintendent of the Chicago, Burlington & Quincy Railroad, will resign this place—regarded as one of the best in the West—to accept an appointment on the Atchison, Topeka & Santa Fe, sometimes reported to be that of taking charge of a proposed extension across Colorado to a connection with the Southern Pacific in Arizona, and sometimes that of General Manager of the road. Mr. Strong has risen rapidly. In 1870 he was General Agent of the Chicago & Northwestern at Omaha, and regarded as one of the most promising men in the service of that company. Afterwards he was Superintendent of the Burlington & Missouri River road, afterwards Assistant General Superintendent of the Chicago, Burlington & Quincy, then for about a year Superintendent of the Michigan Central, whence he was called back to the Chicago, Burlington & Quincy, when Superintendent Robert Harris was made President.

Boston, Hoosac Tunnel & Western.—The officers of this company are: President, Wm. L. Burt; Vice-President, John B. Alley; Treasurer, Estes Howe; Secretary, Theodore Voorhees; Chief Engineer, M. F. Jones.

Boston, Revere Beach & Lynn.—At the annual meeting in Boston, Oct. 18, the following directors were chosen: John B. Alley, Henry Breed, T. B. Dix, Nehemiah Gibson, David Loring, A. B. Martin, Charles W. Slack, George F. Tripp, Edward Tyler, Edwin Walden, David L. Webster, John G. Webster.

Brotherhood of Locomotive Engineers.—At the annual convention in Boston, Oct. 20, the following officers were chosen for the ensuing year: Grand Chief Engineer, P. M. Arthur; First Grand Engineer, T. D. Ingraham; Second Grand Engineer, Wm. Robinson; First Grand Assistant Engineer, L. B. Greene; Second Grand Assistant Engineer, Wm. B. Thrall; Third Grand Assistant Engineer, Daniel Bennett; Grand Guide, Thomas Porter; Grand Chaplain, George W. Tyler. Most of these are re-elected.

Danvers.—At the annual meeting in Boston, Oct. 17, the following directors were chosen: Nathaniel G. White, George C. Lord, Amos Paul, Nathaniel J. Bradlee, Wm. S. Stevens, James R. Nichols, John F. Osgood. The road is leased to the Boston & Maine. The *Newburyport* Company, whose road is also leased to the Boston & Maine, met at the same time and elected the same directors.

Delphos, Bluffton & Frankfort.—The first board of directors is as follows: Carey A. Evans, David L. Williams, Joseph W. Hunt, Joseph Buchanan, Delphos, O.; Wm. J. Craig, Joseph S. Daily, Joseph C. Silver, Bluffton, Ind.

East Tennessee, Virginia & Georgia.—At the annual meeting in Knoxville, Tenn., Oct. 10, the following directors were re-elected: Jos. R. Anderson, Thomas G. Barrett, Joseph H. Earnest, R. C. Jackson, Joseph Jaques, Wm. C. Kyle, C. M. McGhee, S. D. Reynolds, R. H. Richards, Dr. Wm. R. Sevier, John Talbott, of Tennessee; W. T. Walters, Baltimore; Adrian Iselin, M. K. Jesup, R. T. Wilson, New York. The board elected R. T. Wilson President; C. M. McGhee, Vice-President; James G. Mitchell, Secretary and Treasurer; O. H. P. Rogan, Auditor; J. F. O'Brien, Superintendent of Transportation and Repairs; James R. Ogden, General Freight and Ticket Agent; J. B. Hoxsie, Master of Transportation.

Erie.—Mr. Chauncey W. Gardner has been appointed Assistant Superintendent of the Western Division, and placed in special charge of the Bradford Branch.

Evansville & Terre Haute.—At the annual meeting of this company (formerly the Evansville & Crawfordsville) in Evansville, Ind., Oct. 15, the old board was re-elected, as follows: Josephus Collett, W. K. Edwards, W. R. McKeen, J. H. Turner, Terre Haute, Ind.; J. W. Maddox, Vincennes, Ind.; Samuel Bayard, C. R. Bement, J. S. Hopkins, W. Heilman, D. J. Mackey, J. E. Martin, Samuel Orr, H. M. Sweetser, Evansville, Ind. The board elected J. E. Martin President; Leonard Pearson, General Superintendent. Mr. Martin has heretofore filled both offices.

Hannibal & St. Joseph.—The Circuit Court at Chillicothe, Mo., has appointed Mr. Sydney McWilliams Receiver. Mr. McWilliams is a banker of St. Joseph. He has appointed Mr. N. D. Munson, now Division Superintendent on the Chicago, Burlington & Quincy, General Manager of the road. He has also appointed John L. Lathrop Treasurer.

Illinois Midland.—Mr. Thomas Clifford has been appointed General Passenger Agent. He has been for some time a conductor on the road.

Indianapolis, Decatur & Springfield.—At the annual meeting in Indianapolis, Oct. 11, the following directors were chosen: E. F. Leonard, John Bunn, Springfield, Ill.; B. C. Hobbs, Bloomingdale, Ind.; Joseph B. Fordyce, J. R. Elder, J. E. McDonald, E. J. Peck, Indianapolis; J. D. Platt, Dayton, O.; George M. Pullman, Chicago; Benjamin E. Bates, Boston; George Walker, Springfield, Mass.; S. S. Sands, Brooklyn, N. Y.; Henry B. Hammond, Wm. H. Guion, H. C. Fahnestock, Charles Dana, Chauncey Vibbard, New York. The board re-elected Henry B. Hammond President.

Louisville, Cincinnati & Lexington.—The directors of the new company are: George Ainslie, J. B. Bangs, Henry Bell, M. C. Johnson, J. Krieger, Sr., E. D. Sayre, F. P. Schmitt, G. Spratt, E. Thompson, Charles Tilden, James B. Wilder. Mr. James B. Wilder is President.

Memphis & Kansas City.—The first board of directors of this new company is as follows: John D. Bancroft, Wm. H. Chapman, Wm. Godby, A. J. Gillespie, C. E. Robinson, E. W. Smith, Kansas City, Mo.; Edwin H. Chapman, Ballston Spa, N. Y.

New York Elevated.—The board of directors has chosen Mr. Walter Katte Chief Engineer, in place of M. Courtright, resigned. Mr. Katte is from St. Louis and is well known as a bridge engineer; for some time past he has been Treasurer of the St. Louis, Kansas City & Northern Company. He was for many years Assistant Engineer of the Keystone Bridge Company, for some time in Chicago and afterwards at St. Louis, where he supervised the erection of the St. Louis Bridge.

Northern Pacific.—It is reported that Mr. H. E. Sargent, for several years and until about two years ago Superintendent of the Michigan Central Railroad, has been offered and will probably accept the position of General Manager of this road. Mr. Sargent was General Freight Agent of the Michigan Central before he was Superintendent, and began his railroad career, we believe, on the Boston & Albany.

Ohio & Mississippi.—The seceding or New York board has elected Ossian D. Ashley Vice-President; James M. Hartshorne, Treasurer; George E. Borland, Secretary, *pro tem.*

Olean, Bradford & Warren, of New York.—The first board of directors is as follows: C. S. Cary, R. O. Smith, C. V. B. Barse, L. F. Lawton, J. G. Johnson, R. W. Evans, J. B. Strong, James Kelsey, H. S. Morris, M. W. Barse, Olean, N. Y.; Sherman S. Jewett, George B. Gates, Wm. H. Glenny, Buffalo, N. Y. The board has elected C. S. Cary, President; R. O. Smith, Vice-President; H. S. Morris, Secretary and Treasurer.

Portland & Ogdensburg, Vermont Division.—The Vermont Court of Chancery has appointed A. B. Jewett and A. W. Hastings Receivers.

Railway Passenger & Freight Conductors' Mutual Aid and Benefit Association.—At the annual convention in Chicago, Oct. 13, the following officers were chosen: President, James Sherman, Michigan Central; Vice-Presidents, George Hewitt, Chicago & Northwestern, and A. M. Putnam, Illinois Central; Secretary and Treasurer, Charles Huntington, Chicago & Alton; directors, E. A. Sadd, Chicago, Burlington & Quincy; E. D. Latham, Chicago & Alton; Wm. Kilpatrick, Chicago & Northwestern; Thomas P. Robb, Chicago & Lake Huron; F. D. Underwood, Chicago, Milwaukee & St. Paul; David S. Hill, Cincinnati, Lafayette & Chicago; C. E. Hurd, Illinois Central.

Rock Island & Peoria.—The officers of this new company, successor to the Peoria & Rock Island, are: President, P. L. Cable; Vice-President, B. T. Cable; General Manager, R. R. Cable; Secretary, Cornelius Lynde; Treasurer, Joseph Gaskell. The offices are in Rock Island, Ill.

Skaneateles.—At the annual meeting in Skaneateles, N. Y., last week, the following directors were chosen: Joel Thayer, Charles Pardee, Joab L. Clift, Henry T. Webb, Hiram C. Sherman, Thomas Morton, Ezekiel B. Hoyt.

Taunton Locomotive Manufacturing Co.—Mr. P. I. Perrin, late Superintendent, has been appointed Agent and Treasurer, in place of Mr. Harrison Tweed, resigned. Mr. Perrin has been connected with the mechanical department since the organization of the company in 1846.

Utah Northern.—At a meeting held in Logan, Utah, Oct. 10, the board elected Royal M. Bassett President; Wm. B. Preston, Vice-President; Moses Thatcher, Secretary; Robert S. Campbell, Treasurer; George W. Thatcher, Superintendent.

Vermont & Canada.—At the annual meeting in Bellows Falls, Vt., Oct. 18, the old board was re-elected, as follows: Bradley Barlow, St. Albans, Vt.; John N. A. Griswold, Newport, R. I.; James R. Nichols, Haverhill, Mass.; Edward Bangs, John Curtis, Wm. Mixter, Samuel Wells, Boston.

Western Maryland.—At the annual meeting in Baltimore, Oct. 17, the following directors were chosen by the stockholders: Joshua Biggs, Frederick County, Md.; J. K. Longwell, Carroll County, Md.; George W. Harris, Isaac Motter, John Welty, Washington County, Md. The appointment of the Baltimore city directors was made several weeks ago.

PERSONAL.

—Mr. John G. Stevens, President of the United New Jersey Railroad & Canal Company and Receiver of the New York & Oswego Midland, has an article in the November number of *Scribner's Monthly* on "The Erie Canal and its Relations to New York."

—Mr. Harrison Tweed, for many years Agent and Treasurer of the Taunton Locomotive Manufacturing Co., has recently retired from that position.

—Mr. Edward Gordon, one of the oldest locomotive engineers in the United States, died in Columbus, O., Oct. 16, aged 64 years. He was born in New Castle, Del., and at an early age entered a machine shop to learn the trade. He was for a time employed by Norris Brothers and took two engines from their shop to Toledo in 1836. After running on the Reading and New York Central roads for some years he went out with the first engine for the Muskingum Valley road in 1853 and ran on that road until 1868. Since then he has been on the Marietta & Cincinnati and other roads, and finally left the road three years ago, having since kept a hotel in Columbus. Mr. Gordon never had a serious accident but once, when he ran into a fallen tree on the Cleveland, Columbus, Cincinnati & Indianapolis road, and had an arm broken.

TRAFFIC AND EARNINGS.

Water Rates.

There has been a remarkable, and at this season of the year unexpected, fall in lake rates during the week ending with Tuesday last. At the beginning of the week the quotations were 5½ cents a bushel for wheat and 5 for corn from Chicago and Milwaukee to Buffalo; but these rates were forced down until last Tuesday the quotations were 4 cents for wheat and 3¾ for corn.

Meanwhile canal rates have been stationary for wheat and

have risen materially on corn, 12 cents a bushel from Buffalo to New York being the quotation for the former throughout the week, while for the latter the rate has risen from 9½ to 11 cents. So far as corn is concerned, the through rate from Chicago to New York is unchanged, the fall in the lake rate being just balanced by the advance in the canal rate.

The through rail rate is now 24 cents a bushel for wheat and 22.4 for corn from Chicago to New York, 22.8 for wheat and 21.3 for corn to Philadelphia, and 22.2 for wheat and 20.7 for corn to Baltimore. The railroads continue to carry about a million bushels a week from the Northwest.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1876—77.	1875-76.	Inc. or Dec.	P. c.
Year ending May 31:				
Columbus, Chicago & Indiana Central	$3,375,669	.....	.....	....
Expenses	3,094,247	.....	.....	....
Net earnings	$281,422	.....	.....	....
Earnings per mile	5.815	.....	.....	....
Per cent. of exps	91.66	.....	.....	....
Year ending Aug. 31:				
Evansville & Terre Haute	$495,926	$510,740	Dec.. $14,814	2.9
Expenses	350,215	351,578	Dec.. 1,363	0.4
Net earnings	$145,711	$159,162	Dec.. $13,451	8.4
Earnings per mile	4,550	4,686	Dec.. 136	2.9
Per cent. of exps	70.62	68.84	Inc .. 1.78	2.6
Year ending Sept. 30:				
Boston, Revere Beach & Lynn	$115,072	$119,990	Dec.. $4,918	4.1
Expenses	88,338	73,204	Inc .. 15,134	20.7
Net earnings	$26,734	$46,786	Dec.. $20,052	42.8
Earnings per mile	13,076	13,635	Dec.. 559	4.1
Per cent. of exps	76.82	61.00	Inc .. 15.82	25.9
Western Maryland	332,086	311,903	Inc .. 20,193	6.5
Expenses	219,941	215,556	Inc .. 4,385	2.0
Net earnings	$112,145	$96,347	Inc .. $15,798	16 4
Earnings per mile	3,424	3,255	Inc .. 169	5.2
Per cent. of exp'ses	66.23	69.11	Dec.. 2.88	4.2
Nine months ending Sept. 30:	1877.	1876.		
Bur., Cedar Rapids & Northern	$809,809	$831,234	Dec.. $21,425	2.6
Net earnings	240,307	182,509	Inc .. 57,798	31,7
Per cent. of exps	70.33	78.05	Dec.. 7.72	9.6
New Jersey Midland	498,782	478,352	Inc .. 20,340	4.3
Net earnings	112,354	.....	.....	....
Per cent. of exps	77.51	.....	.....	....
Month of September:				
Paducah & Elizabethtown	$28,177	.....	.....	....
First week in October:				
Denver & Rio Grande	$18,542	.....	.....	....
Second week in October:				
Atchison, Topeka & Santa Fe	$95,768	$65,864	Inc .. $29,904	45.4
Missouri, Kansas & Texas	81,943	81,720	Inc .. 223	0.3
St. Louis, Iron Mt. & Southern	147,400	124,243	Inc .. 23,157	18.6
Week ending Oct. 5:				
Great Western, of Canada	$104,725	$98,536	Inc .. $6,189	6.2
Week ending Oct. 12:				
Great Western, of Canada	$93,827	$93,281	Inc .. $546	0.6
Week ending Oct. 13:				
Grand Trunk	$221,694	$201,982	Inc .. $19,712	9.8

Coal Movement.

Coal tonnages for the week ending Oct. 13 are reported as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Anthracite	436,259	553,573	Dec.. 117,314	21.2
Semi-bituminous	69,548	76,358	Dec.. 6,810	8.9
Bituminous, Pennsylvania	48,950	46,059	Inc .. 2,891	6.3

The resumption of work in the anthracite region promises to become general, nearly all of the Scranton miners being already at work.

Actual tonnage passing over the Pennsylvania & New York road for the ten months of the fiscal year ending Sept. 29 was: Anthracite, 633,525; bituminous, 279,648; total, 913,173 tons. The anthracite showed an increase of 16,130 tons, or 2.6 per cent.

Coal shipments from Seattle, Wash. Ter., for September were 9,644 tons, nearly all to San Francisco. For the nine months ending Sept. 30 the shipments were: 1877, 90,898; 1876, 75,646; increase, 15,252 tons, or 20.2 per cent.

Grain Movement.

For the week ending Oct. 13, reports of receipts of grain of all kinds, in bushels, were:

	1877.	1876.	Inc. or Dec.	P. c.
Lake ports' receipts	5,519,469	6,164,195	Dec.. 644,726	10.5
Atlantic ports' receipts	5,742,997	3,712,853	Inc .. 2,030,144	54.7

The receipts at Northwestern ports for a few weeks about this time last year were exceptionally large. For the week above-named they have been for eight years:

Year.	Bushels.	Year.	Bushels.
1870	2,219,757	1874	4,006,901
1871	1,863,748	1875	4,986,513
1872	4,384,120	1876	6,164,195
1873	4,885,946	1877	5,519,469

Thus, though this year's receipts were smaller than last year's, they were much greater than those of any previous year.

In 1873, when the crop and the movement of the crop-year was the largest on record, there was a sudden check to activity a short time after the panic of Sept. 20, but it had nearly recovered by the week above-named.

For the four weeks ending Oct. 17 the exports of grain from the several Atlantic ports were: 13,322,698 bushels in 1877, against 8,987,856 in 1876, an increase of 4,334,842 bushels, or 48 per cent. This year the average exports were 3,330,675 bushels per week. The wheat exports were more than three times as great as last year.

Receipts and shipments at Chicago for the week ending Oct. 20 were:

	1877.	1876.	Inc. or Dec.	P. c.
Receipts	2,143,920	2,806,544	Dec.. 662,624	23.6
Shipments	2,621,561	1,825,151	Inc .. 796,410	43.6

Petroleum Movement.

Stowell's *Petroleum Reporter* gives the production of the Pennsylvania oil regions for September at 1,214,910 barrels. Shipments for the month of crude oil and refined reduced to crude were 1,563,797 barrels, an increase of 409,248 barrels, or 35.4 per cent., over September, 1876. The stock reported on hand at the close of the month was 2,503,657 barrels.

East-Bound Rates.

We noted last week a change in the fourth-class and grain rates which went into effect Wednesday, Oct. 17. Still another tariff went into effect Monday, Oct. 22. The only difference between this latter and the tariff of the Wednesday is an advance in boxed meats from 40 to 45 cents per hundred, in bulk meats from 45 to 50, and in dressed meat from 70 to 75—all from Chicago to New York.

Neither change affected the three higher classes of freight (which are hardly ever changed) nor some of the special classes. The advances Oct. 17 over the tariff of Sept. 4 were (in the Chicago-New York rate): Fourth class freight 35 to 40 cents per 100 lbs.; grain, malt, mill feed, middlings and bran in bulk, car loads, from 35 to 40; flour and corn meal in lots of 10 barrels and over, from 70 to 80 cents per barrel; flour and meal in sacks, owner's risk, car-loads, from 40 to 45 cents per 100 lbs.; boxed meats, from 35 to 40; bulk meats, from 40 to 45; beef, pork, lard, lard oil, tallow, stearine, hams, shoulders or grease, in barrels or tierces, advanced from 35 to 40 cents per 100 lbs.; grass and clover seed from 45 to 50.

The rate to Boston is 5 cents higher per .00 lbs.; that to Philadelphia 2 cents and that to Baltimore 3 cents lower than the New York rate.

West-Bound Rates.

Rates were advanced Monday, Oct. 22, to the following figures per 100 lbs.

	1st.	2d.	3d.	4th.
Cleveland	$0 65	$0 59	$0 49	$0 30
Columbus	80	72	60	36
Cincinnati	92	83	70	41
Indianapolis	95	85	71	43
Louisville	1 13	1 02	86	55
St. Louis	1 28	1 16	97	61
Toledo	77	69	58	35
Chicago	1 00	90	75	45
Milwaukee	1 00	90	75	45
Detroit	70	63	53	32

The rates from Baltimore are eight cents less on first and second classes, and three cents less on third and fourth classes than the rates from New York. From Philadelphia they are six cents less on first and second classes, and two cents on third and fourth classes.

This is the first advance since the apportionment scheme went into effect, with the exception of that made by raising special-class freight to the fourth class.

Live Stock Rates.

When the last change in ordinary freight rates to the East was made, there was also a change in live stock rates, making them as follows:

Chicago to—	Cents.	Chicago to—	Cents.
Boston	65	Buffalo, Suspension Bridge,	
New York	60	Pittsburgh, Akron, Wheeling and Bellaire	32½
Philadelphia	58	Dunkirk	30
Baltimore	57	Cleveland	26
Albany	55	Sandusky	23
		Toledo and Detroit	20

By agreement the rates from St. Louis are to be five per cent. per 100 lbs. more than from Chicago.

RAILROAD EARNINGS IN SEPTEMBER.

Name of Road.	Mileage. 1877.	1876.	Inc.	Dec.	Per c.	Earnings. 1877.	1876.	Increase.	Decrease.	Per c.	Earnings per Mile. 1877.	1876.
Atchison, Topeka & Santa Fe	711	711	.....	.....	.....	$284,414	$254,024	$30,390	.....	12.0	$400	$357
Burlington, Cedar Rapids & Northern	389	368	21	.....	5.7	194,226	90,800	103,426	.....	113.9	499	247
Cairo & St. Louis	146	146	.....	.....	.....	19,745	23,703	.....	$3,958	16.7	137	149
Central Pacific	1,818	1,578	240	.....	15.2	1,420,535	1,871,875	.....	451,340	24.1	781	1,186
Chicago & Alton	679	650	29	.....	4.5	473,323	524,244	.....	50,921	9.7	697	807
Chicago, Milwaukee & St. Paul	1,402	1,400	2	.....	0.1	1,180,000	645,831	534,169	.....	82.7	842	461
Chicago & Northwestern	1,514	1,501	13	.....	0.9	1,540,000	1,182,830	357,170	.....	30.3	1,017	788
Cleveland, Mt. Vernon & Delaware	157	157	.....	.....	.....	38,687	35,021	3,666	.....	10.5	246	223
Dakota Southern	78	78	.....	.....	.....	25,534	19,618	5,916	.....	30.2	327	252
Denver & Rio Grande	298	206	92	.....	44.7	78,033	46,029	32,004	.....	69.6	262	223
Detroit & Milwaukee	192	192	..	.....	.....	99,774	92,234	7,540	.....	8.2	520	480
Hannibal & St. Joseph	296	296	.....	.....	.....	211,917	187,575	24,342	.....	13.0	716	634
Illinois Central, Illinois lines	707	707	.....	.....	.....	563,015	488,594	74,421	.....	15.2	796	691
" " Iowa lines	402	402	.....	.....	.....	191,239	127,698	63,541	.....	49.8	476	318
Indianapolis, Bloomington & Western	344	344	.....	.....	.....	121,909	121,378	531	.....	0.4	354	353
International & Great Northern	516	459	57	.....	12.4	136,000	133,102	2,898	.....	2.2	264	290
Kansas Pacific	673	673	.....	.....	.....	341,661	301,959	39,702	.....	13.1	508	449
Louisville & Nashville	966	921	45	.....	4.9	526,058	492,178	33,880	.....	6.9	545	534
Missouri, Kansas & Texas	786	786	.....	.....	.....	307,179	324,144	.....	16,965	5.2	391	412
Missouri Pacific	426	426	.....	.....	.....	347,991	370,015	.....	22,024	6.0	817	869
Nashville, Chattanooga & St. Louis	341	341	.....	.....	.....	157,424	132,828	24,596	.....	18.5	462	390
New Jersey Midland	86	86	.....	.....	.....	59,027	65,377	.....	6,350	9.7	686	760
Paducah & Memphis	115	115	.....	.....	.....	14,591	15,374	.....	783	5.1	127	134
St. Louis, Alton & Terre Haute—Belleville Line	71	71	.....	.....	.....	49,666	44,615	5,051	.....	11.3	700	628
St. Louis, Iron Mountain & Southern	685	685	.....	.....	.....	410,700	354,914	55,786	.....	15.7	600	518
St. Louis, Kansas City & Northern	530	530	.....	.....	.....	321,186	290,600	30,586	.....	10.5	606	548
St. Louis & San Francisco	328	328	.....	.....	.....	132,990	137,416	.....	4,426	3.2	405	419
St. Louis & Southeastern	356	356	.....	.....	.....	108,696	104,400	4,296	.....	4.1	305	293
Texas & Pacific	444	333	111	.....	33.3	253,276	174,893	78,383	.....	44.8	570	525
Toledo, Peoria & Warsaw	237	237	.....	.....	.....	146,596	176,547	.....	29,951	17.0	619	745
Wabash	680	628	52	.....	8.3	462,165	425,142	37,023	.....	8.7	680	677
Totals	16,373	15,711	662	.....	.....	$10,217,557	$9,254,958	$1,542,317	$586,718	.....	$624	$589
Total increase	.....	.....	662	.....	4.2	.....	.....	962,599	.....	10.4	.....	.....

RAILROAD EARNINGS, NINE MONTHS ENDING SEPTEMBER 30.

Name of Road.	Mileage. 1877.	1876.	In.	Dec	Per c.	Earnings. 1877.	1876.	Increase.	Decrease	P. c.	Earnings per mile. 1877.	1876.	Inc.	Dec.	P. c.
Atchison, Topeka & Santa Fe	711	693	18	....	2.6	$1,763,799	$1,746,816	$16,983	.....	1.0	$2,481	$2,521	.....	$40	1.6
Burlington, Cedar Rapids & Northern	370	368	2	....	0.5	809,809	831,234	.....	$21,425	2.6	2,189	2,259	.....	70	3.1
Cairo & St. Louis	146	146	....	....	.....	175,802	195,542	.....	19,740	10.1	1,204	1,339	.....	135	10.1
Central Pacific	1,766	1,346	420	....	31.2	12,036,107	13,136,195	.....	1,100,088	8.4	6,815	9,759	.....	2,944	30.2
Chicago & Alton	679	650	29	....	4.5	3,302,720	3,685,410	.....	382,690	10.4	4,864	5,670	.....	806	14.2
Chicago, Milwaukee & St. Paul	1,402	1,400	2	....	0.1	5,372,460	5,861,393	.....	488,933	8.3	3,832	4,187	.....	355	8.4
Cleveland, Mt. Vernon & Delaw.	157	157	....	....	.....	281,345	279,312	2,033	.....	0.7	1,792	1,779	$13	.....	0.7
Denver & Rio Grande	283	159	124	....	78.0	542,254	334,451	207,803	.....	62.1	1,916	2,104	.....	188	9.0
Grand Trunk	1,389	1,389	....	....	.....	6,711,980	6,978,467	.....	266,487	3.8	4,833	5,024	.....	192	3.8
Great Western, of Canada	496	496	....	....	.....	2,780,875	2,964,955	.....	184,080	6.6	5,607	5,978	.....	371	6.6
Hannibal & St. Joseph	296	296	....	....	.....	1,492,274	1,401,745	90,529	.....	6.5	5,041	4,736	305	.....	6.5
Illinois Central, Illinois lines	707	707	....	....	.....	3,621,110	4,036,929	.....	415,819	10.3	5,122	5,710	.....	588	10.3
Indianapolis, Bloom. & West'n	344	344	....	....	.....	914,667	1,117,691	.....	203,026	18.2	2,659	3,249	.....	590	18.2
International & Gt. Northern	516	459	57	....	12.4	998,560	859,060	139,500	.....	16.2	1,933	1,872	61	.....	3.3
Kansas Pacific	673	673	....	....	.....	2,271,893	2,154,821	117,072	.....	5.4	3,376	3,202	174	.....	5.4
Louisville & Nashville	963	921	42	....	4.6	3,935,636	3,667,986	267,650	.....	7.3	4,087	3,983	104	.....	2.6
Missouri, Kansas & Texas	786	786	....	....	.....	2,314,584	2,260,652	53,932	.....	2.4	2,945	2,876	69	.....	2 4
Missouri Pacific	426	426	....	....	.....	2,795,019	2,680,932	114,087	.....	4.3	6,561	6,293	268	.....	4.3
Nashville, Chattanooga & St. Louis	341	341	....	....	.....	1,255,060	1,267,962	.....	12,902	1.0	3,681	3,718	.....	37	1.0
New Jersey Midland	86	86	....	....	.....	498,782	478,352	20,430	.....	4.3	5,800	5,562	238	.....	4.3
Paducah & Memphis	115	115	....	....	.....	134,414	150,173	.....	15,759	10.5	1,169	1,306	.....	137	10.5
St. Louis, Alton & Terre Haute, Belleville Line	71	71	....	....	.....	365,341	344,816	20,525	.....	6.0	5,146	4,857	289	.....	6.0
St. Louis, Iron Mt. & Southern	685	685	....	....	.....	2,985,326	2,606,047	379,279	.....	14.6	4,358	3,804	554	.....	14.6
St. Louis, Kansas City & North'n	530	524	6	....	1.1	2,228,910	2,263,520	.....	34,610	1.5	4,205	4,320	.....	115	2.7
St. Louis & San Francisco	328	328	....	....	.....	963,036	951,680	11,356	.....	1.2	2,936	2,901	35	.....	1.2
St. Louis & Southeastern	356	356	....	....	.....	798,364	788,288	10,076	.....	1.3	2,243	2,214	29	.....	1.3
Texas & Pacific	357	325	32	....	9.9	1,606,223	1,189,803	416,420	.....	35.0	4,499	3,661	838	.....	22.9
Toledo, Peoria & Warsaw	237	237	....	....	.....	840,733	1,106,152	.....	265,419	24.0	3,547	4,667	.....	1,1 0	24.0
Wabash	634	628	6	....	1.0	3,210,421	3,205,328	5,093	.....	0.2	5,064	5,104	.....	40	0.8
Totals	15,850	15,112	738	....	.....	67,007,504	68,545,714	$1,872,768	3,410,978	.....	$4,228	$4,536	.....	$308	6.8
Total increase or decrease	.....	.....	738	....	4.9	.....	.....	.....	1,538,210	2.2	.....	.....	.....	.....	.....

THE SCRAP HEAP.

Railroad Manufactures.

The Passaic Rolling Mill Co., at Paterson, N. J., is running its mills and machine shops also night and day, and is ful of orders. The company has just received the contract for a highway bridge over the Passaic River at Belleville, N. J., and another over the Hudson River Railroad track at Yonkers, N. Y.

Messrs. Miller, Metcalf & Parkin, of the Crescent Steel Works, Metcalf, Paul & Co., of the Verona Tool Works, and the Crescent Spring Co., all of Pittsburgh, have opened branch offices at No. 720 North Second street, St. Louis, and No. 38 Dearborn street, Chicago. These offices will be managed and the three concerns represented in the West by Messrs. Albert L. Butler, George H. Ismon and P. H. Patriarche. The business and accounts of the three concerns will remain entirely separate.

The Keystone Iron Works, at Reading, Pa., are running five days per week on boiler-plate and bar iron.

Wm. McIlvain & Sons, at Reading, Pa., are running their rolling mill single turn on boiler-plate and flange iron.

The Philadelphia & Reading Coal & Iron Co. is running its rail mill at Reading five days per week.

The Louisville (Ky.) Bridge & Iron Works recently completed a double-track iron bridge over White River for the Indianapolis Belt road. Besides the Cincinnati Southern bridge over the Tennessee River near Chattanooga they have contracts for bridges on the Louisville & Nashville, the Mississippi & Tennessee, the Natchez, Jackson & Columbus, and for several highway bridges.

The board of directors of the Jersey City (N. J.) Iron Works have re-elected James Brahn, President; Freeman A. Smith, Treasurer; Walter C. Meeker, Secretary.

The Altoona (Pa.) Iron Co. is running its rolling mill on bar, band and nut iron, and employs about 125 men.

The Central Iron Works, at Harrisburg, Pa., are running full time on boiler plate and tank iron. A new mill is being built, and is nearly completed.

The Lochiel Iron Co., at Harrisburg, Pa., is running its blast furnace, but the rolling mill is idle.

The Paxton Rolling Mill, at Harrisburg, Pa., is running full time on plate iron, employing about 175 men.

Atkins Brothers, at Pottsville, Pa., are running their rolling mill, chiefly on mine and street rails, to about two-thirds of its full capacity.

Hotchkiss & Gaylord, at Cleveland, O., have several orders from Canada for bridge-bolts.

The New Albany (Ind.) Rolling Mill is re-rolling iron rails for the Ohio & Mississippi.

The Cleveland (O.) Steam Gauge Co. is making Watson's patent portable forge. One pattern is intended specially for railroad work.

The Licking River Iron Works, at Covington, Ky., have been started up by Worthington & Dwyer, the new owners.

The Cleveland City Forge & Iron Works are running three hammers and employing over 50 men.

The blast furnace at Brownsport, Tenn., is preparing to go into blast.

McIntosh, Hemphill & Co., of Pittsburgh, are building a new

35-inch blooming mill for the new steel works of the Roane Iron Co., at Chattanooga, Tenn.

Park Brothers & Co. are running their steel works at Pittsburgh single turn and employing about 400 men.

The Ohio Falls Car Works, at Jeffersonville, Ind., last week received orders for 75 narrow-gauge box cars.

Wilson, Walker & Co., at Pittsburgh, are running their works single turn on orders for forgings and railroad supplies.

The Baldwin Locomotive Works, at Philadelphia, have an order for three locomotives of 3 ft. 6 in. gauge for the Queensland (Australia) State Railroad.

In the suit between the Keystone Bridge Co. and the Phœnix Iron Co. for infringement of patent the United States Circuit Court dismissed the bill on the ground that it was not shown that the defendants had done more than to manufacture the iron used in the construction of bridges on the principle of the patent. The United States Supreme Court now affirms the decree, but for the reason that the patentee cannot show that his invention is broader than was stated in his claim upon which the patent is granted, which, it is said, was attempted in the case.

The Atlanta (Ga.) Rolling Mill has orders for 1,000 tons of iron rails for the Western & Atlantic and 500 tons for the Georgia Railroad.

Lucy Furnace No. 2, at Pittsburgh, which went into blast Sept. 25, made 446 tons of Bessemer pig the first week. Lucy Furnace No. 1 is in blast and averages 100 tons of Bessemer pig iron per day. The entire product of both furnaces is taken by the Edgar Thomson Steel Works.

A New Safety Car.

Two improvements in the construction of passenger cars have recently been patented by C. C. Gilman, formerly President of the Central Railroad Company of Iowa. The specifications describe a loose or independent hatch in the top of the car, covering an opening sufficiently large to allow the egress of the largest person. This hatch is sufficiently heavy to retain its position while the car is upright, but falls off when the car is turned over.

The specifications also describe a car door with bevelled edges, fitting bevelled jambs so closely that when a car turns over the shock forces the door off of its hinges, even if securely locked.

The object of both inventions is to provide an immediate way of exit from the car in case of a wreck and especially to prevent loss of life should a wrecked car take fire after being thrown down a bank or upset.

Religion for Railroad Men.

A conference was to be held in Cleveland, O., this week, beginning Oct. 25 and continuing for four days, under the auspices of the Executive Committee of the Young Men's Christian Association of the United States. It is expected there will be a large number present, and that the meeting will be one of considerable interest.

The following topics have been suggested for discussion at the conference:

The peculiar temptations and trials of railroad men, and what can we do to counteract them?—W. R. Davenport, Erie, Pa.

Christian work by and for railroad men, what has been done and what can be done?—E. D. Ingersoll, railroad visitor of the Executive Committee.

What can we do to secure the approval and co-operation of the general officers of the railroads in the prosecution of Christian work among their employes?

The general secretary's duties, hospital visitation, tract work, etc.—Lang Sheaff, Cleveland, O.

The work on behalf of railroad men in charge of the International Committee, and our duty in relation to it.—Russell Sturgis, Jr., Boston, Mass.

Cottage prayer meetings and meetings upon the grounds or in the shops of the railroad company.—O. R. Stockwell, Columbus, O.

What are you doing specially for railroad men in your town? T. B. Patton, Altoona, Pa. To be followed by reports from all places represented in the Convention.

God's word: How shall it be studied, and the study of it be promoted in our work?—George W. Cobb, Cleveland, O.

Steam Street Cars.

The Railroad Committee of the Brooklyn (N. Y.) City Council has reported in favor of permitting the use of steam motors on the following lines in that city: Broadway & East New York, from Flushing avenue to East New York; Bushwick Avenue, from Flushing avenue along Myrtle avenue to Cypress Hills Cemetery; North Second Street & Middle Village, from Broadway through First and North Second streets to the city line. All of these are partly suburban lines.

OLD AND NEW ROADS.

Atlantic & Pacific Telegraph.

It is reported that matters are not working very smoothly between this company and the Western Union, the recent pooling agreement not having been sufficiently explicit in details, especially in providing for the division of working expenses.

Atlantic & Gulf.

A bill for the foreclosure of the second mortgage has been filed in the United States Circuit Court by the trustees.

Atlantic & Great Western.

The Meadville (Pa.) *Crawford Journal* of Oct. 20 says: "Belden & Co., the contractors who graded the Pennsylvania Petroleum Railroad, brought suit in July last to compel the Atlantic & Great Western Railroad to pay over so much of the proceeds of the sale of certain trust bonds as is due them. These bonds were issued and sold to build the Pennsylvania Petroleum Railroad, and purchase the Shenango & Allegheny, and Pithole Valley railroads, and the property now owned by the Mercer Mining & Manufacturing Company. Belden & Co. filed a bill in equity, Oct. 1, complaining that there was an effort being made to turn the balance of this trust fund over to the Shenango & Allegheny Railroad Company, bonds of that corporation to be issued therefor, and asked an injunction restraining them from doing it. The injunction was issued Oct. 4, and on the 6th continued to the 22d, Monday next, when the case will be argued."

Boston, Revere Beach & Lynn.

At the annual meeting in Boston, Oct. 18, the stockholders voted to confirm the action taken at the special meeting on Sept. 5 last, this being necessary on account of an informality in the proceedings then. There was considerable discussion on the financial condition of the company, and the President urged the stockholders to take the new 8 per cent. bonds of the company, in order to clear off the floating debt. No action on this point was taken by the meeting.

It has since been announced that the company has borrowed $210,000 for one year at 8 per cent., the loan to be secured by the pledge of the new bonds of the company in the proportion of $7,000 of the bonds for each $5,000 borrowed. The loan has been made up by a number of the directors and stockholders, and is to be increased to $225,000, which will be sufficient for the company's necessities.

Boston & Albany.

The Springfield *Republican* of Oct. 22 says: "The Boston & Albany Railroad accounts, as made up for the State year ending Sept. 30, prove that the business of the road has justified a clear 8 per cent. dividend, without charging a dollar of the current expenses to construction account, notwithstanding some 3,000 tons of steel rails have been laid, and the replacement of old bridges with new has gone on. With the expansion of business accruing and now prospective, the net earnings of the current year promise to equal 10 per cent. on the capital stock. The railroad business is generally good throughout New England, the tonnage of business confirming other testimony to the effect that the *volume* of trade is steadily increasing, although the *profit* of it is small."

Brotherhood of Locomotive Engineers.

The annual session of the Grand Division began in Boston, Oct. 17, and is, we believe, not yet concluded. Delegates are present from 192 divisions. The proceedings have been strictly secret, as usual, and nothing has been published beyond the fact of the meeting and the election of officers for the ensuing year.

Camden, Gloucester & Mt. Ephraim.

This company is making arrangements to begin work on an extension of its road from Mt. Ephraim, N. J., south to Blackwoodtown, about six miles.

Canada Southern.

A circular issued to the bondholders gives the particulars of the proposed adjustment, which has been already pretty fully stated. The proposed new issue of general mortgage bonds is to be $14,000,000, bearing 3 per cent. for three years and 5 per cent. for the remaining 27 years, the New York Central & Hudson River to guarantee the interest for 20 years. Bonds will be exchanged as follows:

	Old bonds.	New bonds.
Canada Southern first-mortgage	$8,703,000	$8,703,000
Canada Southern second-mortgage	2,044,189	643,919
Canada Southern Bridge	833,000	833,000
Erie & Niagara	453,000	226,500
Toledo, Canada Southern & Detroit	1,407,737	985,416
Michigan Midland & Canada	262,010	65,503
Total	$13,702,936	$11,457,338

The remaining $2,542,662 of new bonds will be used in settlement of floating debt and for new equipment, which is much needed.

Central Vermont.

This company has laid this season nearly 5,000 tons of steel rails, chiefly between St. Albans and Montpelier Junction, and has also new ballasted most of that part of the road. A new draw has been put in the Alburgh bridge, and preparations made to renew the whole bridge. The company is now raising the roofs of all the covered bridges so as to give more clearance above the cars.

Chicago, Millington & Western.

A bill in foreclosure was recently filed by some of the bondholders of this unfinished road, which is now superseded by a similar bill filed by the trustee, the Union Trust Company, of New York, in the United States Circuit Court in Chicago, Oct. 15. The mortgage is for $1,500,000; the road has some 10 miles of track laid, but has never been operated.

Cincinnati, Sandusky & Cleveland.

The annual meeting was held at Sandusky, O., Oct. 17. After some discussion it was resolved, in view of the present condition of the affairs of the company and the negotiations now in progress with the bondholders, to take no action at present, but to adjourn the meeting and election until Jan. 16, 1878, subject to the power of the directors to call a special meeting sooner, if deemed advisable.

The stockholders of the leased Columbus, Springfield & Cincinnati road met the following day and took similar action.

Cincinnati Southern.

The statement of the Common Carrier Company operating the road for the fractional quarter ending Sept. 30 is as follows:

Passenger earnings	$31,314 35
Freight earnings	28,760 72
Miscellaneous	634 32
Total ($391 per mile)	$61,709 39
Expenses (38.50 per cent.)	23,759 11
Net earnings ($240 per mile)	$37,950 28
Interest on capital paid in at 10 per cent. per year	$2,257 34
Ten per cent. of balance, as per contract	3,569 29
	5,826 63
Balance due trustees under contract	$32,123 65

The company has made a final call of 20 per cent. on all subscriptions to the stock, payable one-half Oct. 20 and one-half Nov. 1.

Cleveland, Newton Falls, Salem & Salineville.

At a recent meeting of the board in Salem, O., it was resolved to have a preliminary survey of the road made at once, with a view to letting contracts for the grading. The line is from Cleveland east by south to Newton Falls, and thence south to Salineville in Columbiana County, about 80 miles in all.

Columbus & Northwestern.

This company has filed articles of incorporation in Ohio for a narrow-gauge road from Columbus, O., west to Urbana and thence northwest through Sidney and Celina to Fort Wayne, Ind. The distance is about 150 miles, through a country already pretty well provided with railroads.

Danbury & Norwalk.

The report that negotiations were pending for a lease of this road to the Housatonic Company is denied by authority.

Delaware & Hudson Canal.

The *Commercial and Financial Chronicle* says: "It is reported that the whole of the recent mortgage of the Delaware & Hudson not reserved to cover the $1,500,000 bonds due Nov. 1, and the $3,500,000 reserved to cover a mortgage of the same class, hereafter due, has been taken, $5,000,000 in amount, by a syndicate of the directors of the company, Messrs. Astor, Kennedy and Pierpont Morgan."

The reported price at which the bonds are taken is 90 cents on the dollar.

Delphos, Bluffton & Frankfor

A company by this name has been organized to build a rail road from Delphos, O., west by south through Bluffton to Frankfort, Ind., about 95 miles.

Denison & Southeastern.

This company has filed articles of incorporation to build a road from Denison, Tex., southeast to Greenville, 50 miles. Work on the grading has already been begun.

Dividends.

Dividends have been declared as follows:

Boston & Maine, 3 per cent., semi-annual, payable Nov. 15.

Railway Equipment Trust of Pennsylvania, 2 per cent., quarterly, payable Nov. 1.

East Tennessee, Virginia & Georgia.

At the annual meeting in Knoxville, Tenn., Oct. 10, the stockholders approved the report submitted by the board, and also voted to ratify and approve the agreement made by the board for the lease of the Memphis & Charleston Railroad.

Florida Central.

This company has purchased 1,000 tons of new iron and several new cars, and is doing a good deal of work in putting the road and equipment in better order than it has been for a long time past.

Hannibal & St. Joseph.

The Missouri Circuit Court before which the Morse application for a receiver was tried, reconsidered its order putting the case over to Nov. 14, and on Oct. 17 made an order granting the application for a receiver and appointing to that position Mr. Sidney McWilliams, a banker of St. Joseph. Mr. McWilliams has since taken possession of the road and has appointed Mr. N. D. Munson, late a Division Superintendent on the Chicago, Burlington & Quincy, to be General Manager.

Counsel for the company at once took an appeal from the decision of the Circuit Court. The appeal came before the Supreme Court of Missouri Oct. 23, in the form of a petition for an appeal and for the granting of a *supercedeas* to stay the appointment of the Receiver. The Supreme Court took the application and granted until Oct. 25 for the filing of objections. The case is expected to be heard this week. The Circuit Court based its order granting the receivership on its conclusion that the evidence showed gross mismanagement of the company's affairs, and that its bankruptcy was inevitable.

On Oct. 18, after the Receiver's appointment had become generally known, an informal and very excited meeting of stockholders was held in the company's office in New York. President Richardson stated that $160,000 had been borrowed to meet the September interest, the company giving its note for $250,000 and pledging as collateral security $500,000 land-grant bonds and $1,450,000 in unissued bonds. The floating debt, including taxes due, was about $430,000, about $75,000 of which could be paid from the surplus earnings of the last two months. Much comment was caused by the conditions of the loans made, and, after some excited discussion, resolutions were adopted instructing the directors to take an appeal in the receivership case, and also requesting President Richardson to resign at once. A committee was appointed to advise with the board of directors. Mr. Richardson subsequently complied with the resolution and tendered his resignation to the board, but it has not yet been accepted.

The committee appointed at the meeting has since received a number of subscriptions from stockholders to be used to pay off the $160,000 loan and release the large amount of securities pledged. The committee also claims to have received proxies for a majority of the stock to be voted at the coming annual meeting, and it is probable that there will be a complete change in the management.

Mr. Griswold, Chairman of the board of directors of the Chicago, Burlington & Quincy, has written a letter to deny certain reports that that company had taken part in or was supporting the application for a receiver. Current rumor is that the whole proceeding results from an attempt of Jay Gould to secure control of the road.

Logansport, Crawfordsville & Southwestern.

The Receiver reports for September as follows:

Balance, Sept. 1	$11,976 55
Receipts for the month	23,521 87
Total	$35,498 42
Disbursements for the month	18,859 74
Balance, Oct. 1	$16,638 68

The receipts were $4,662.13 in excess of the disbursements for the month.

Long Island.

The winter time-table on this road provides, as usual, for a considerable reduction in train service. Under it, also, several of the cross-lines and branches built as competing lines and now rendered unnecessary are abandoned, the principal lines thus given up being the branch of the leased Southern road from Valley Stream to Hempstead, and a part of the Rockaway Branch of the Southern.

The company is reported to be somewhat embarrassed by its heavy floating debt and some of its notes are said to have gone to protest. The New York papers report proceedings by attachment and otherwise to recover claims against the company by holders of supply bills and similar claims.

Lorain, Wooster & Perry County.

A company by this name has filed articles of incorporation for the purpose of building a railroad from Lorain, O., on Lake Erie, nearly due south to Pomeroy on the Ohio River, about 175 miles. The capital stock is to be $500,000.

Master Car-Builders' October Meeting.

The first of the monthly meetings for this season was held at the rooms, No. 113 Liberty street, New York, Oct. 18. It was merely preparatory, and was held for the purpose of making arrangements for the coming winter. The meetings will be held the same evening as heretofore, which has been the third Thursday of the month. A committee of three, consisting of Mr. C. A. Smith, the Secretary of the Association; Mr. F. D. Adams, of the Boston & Albany Railroad, and Mr. John Kirby, of the Lake Shore & Michigan Southern Railway, was appointed to present topics for consideration and invite persons to take part in the discussion thereof. This committee recommended that at the next meeting, which will be held on the 15th of November, "The Annual Rate of Depreciation of Railroad Cars" be considered. The President of the Association, Mr. Leander Garey, was requested to be the first speaker.

Meetings.

The annual meeting of the Erie Railway Company will be held at the office, No. 187 West street, New York, Nov. 27, at 10 a. m. Transfer books will be closed from Oct. 27 to Nov. 28.

Memphis & Kansas City.

A new company by this name has been organized to build a narrow-gauge railroad about 100 miles long from Kansas City, Mo., south by east through Harrisonville and Butler to the Marmaton River in Vernon County. Much of the line follows the graded road-bed of the old Kansas City, Memphis & Mobile road. The capital stock is fixed at $700,000.

Montclair & Greenwood Lake.

The first-mortgage bondholders at a recent meeting resolved to begin proceedings to foreclose their mortgage, and appointed a committee consisting of Cyrus W. Field, D. A. Lindley, Wm. C. Sheldon and A. W. Benson. It is said that the second-mortgage bondholders and stockholders will contest any foreclosure suit, chiefly on the ground that the first-mortgage bonds have not been sold but only hypothecated as security for loans, and that the present holders do not really own them.

Montreal, Portland & Boston.

This company does not succeed in building its road very fast, but it has more law-suits on hand, probably, than any other company of its size in the United States or Canada. The latest suit against it is brought in Montreal by the President of the Connecticut & Passumpsic Rivers Railroad Company to recover $97,000 for alleged breach of contract, in some of the former transactions between the two companies.

New Jersey Railroad Taxation.

The case of the Morris & Essex Railroad Company against the State Commissioner of Railroad Taxation was argued last

week before the United States Supreme Court, on an appeal from the New Jersey Court of Errors and Appeals. The point at issue is whether the charter of the company, and certain supplements thereto, constitute such a contract with the State as to exempt the company from subsequent legislation, the exemption claimed in this case being from the general railroad tax law of 1873.

New Jersey Midland.

The earnings for September and the nine months ending Sept. 30 were as follows:

	September.	Nine months.
Passengers	$15,524 88	$103,827 94
Freight and milk	40,271 77	334,955 95
Miscellaneous	3,230 61	54,998 35
Total	$59,027 26	$493,782 24
Working and terminal expenses	47,563 54	386,428 12
Net earnings	$11,463 72	$112,354 12
Per cent. of expenses	80.58	77.51

The Receivers' account for the month is as follows:

Balance Sept. 1		$1,048 89
Earnings, as above		59,027 26
Loan account		16,900 00
Total		$76,976 15
Working and terminal expenses	$47,563 54	
Middletown, Unionville & Water Gap lease	1,000 00	
Montclair & Greenwood Lake terminals	2,638 74	
Right of way claims	450 60	
Construction account	2,991 85	
Equipment account, payments on cars	966 11	
Discount and interest	369 37	
Loan account	19,949 17	
		75,928 78
Balance Oct. 1		$1,047 37

As compared with 1876 the earnings for September show a decrease of $6,349.50, or 9.7 per cent.; for the nine months an increase of $20,430.54, or 4.3 per cent. The statement is of actual cash receipts and payments.

New York Central & Hudson River.

The Schenectady (N. Y.) *Union* reports that this company is making arrangements to build a branch from that city to Saratoga. It will be built by a separate company and leased to the New York Central. The company to build the proposed branch was, according to the *Union*, organized last week, and the preliminary survey is to be begun in a few days.

Ohio & Mississippi.

The following defense of the Garrett party and their recent election is given in a letter by one of the Garrett directors to the New York *Tribune*:

"The Messrs. Garrett are not only the largest holders of the second mortgage bonds of the Ohio & Mississippi Railway Company, but they are also by far the largest stockholders in the company. In fact, it is safe to assume that they own more common stock than the whole array of their opponents. It is well known in Wall street that transfers of non-dividend-paying stocks are infrequent, and, in cases similar to the recent election of directors at Cincinnati, in which the transfer books have been closed for upward of thirteen months, the registry affords no clue whatever as to the *bona fide* holders. Prior to his departure for Cincinnati, Robert Garrett had full assurance from the authorized representative of the bondholders of the Springfield Division of his support. He controlled proxies on bonds and stock to the amount of $5,000,000. In addition to this Mr. Garrett and his immediate friends controlled proxies for an equal amount. Being informed that the opposition party possessed only $11,000,000 of proxies, Mr. Garrett also took certificates for about 27,000 shares of common stock, which, it was judged, would be sufficient to nullify a corresponding amount of proxies in the hands of the opposition.

"These are the preliminary facts. On arriving at Cincinnati, and not till then, Mr. Garrett was informed by the aforesaid representative that his votes would be cast for the opposition, and, it being impossible at that stage of the proceedings to counteract the effects of this breach of faith by the usual methods, Mr. Garrett was compelled to have recourse to those legal rights to which, by virtue of the possession of his certificates of stock, he was entitled. The 'compromise' which Mr. Garrett proposed, and which has elicited so much indignation from the opposition party, was simply the expression of a willingness on his part to aid in the election of any desirable directors except Mr. W. D. Griswold. It is scarcely reasonable to expect that men of such standing as Messrs. Bishop, Gerrard, Whitewright, Scarborough, Iselin and Meyer will consent to resign for the purpose of gratifying the whims of Mr. Bloodgood and his confreres. It would be interesting to know how much money has been collected under the resolution authorizing the assessment of fifteen cents on each 100 shares of stock represented at the recent 'stockholders' meeting,' and also what disposition has been made of such funds, but it is reasonable to assert that the entire board of opposition directors, barring Mr. Bloodgood, do not own or represent $1,000,000 of the stock and bonds of the company, while, on the other hand, Mr. Garrett declares his ability to produce upward of $10,000,000 of its securities, should an event similar to the late election require it. The absurdity of the accusation that he is 'robbing' a property in which he is so largely interested is too manifest to require demonstration. The so-called 'representation' of $11,000,000 of the capital of the road by the opposition is a misnomer, and calculated only to deceive; these proxies having been obtained, in a large majority of instances, from holders of record, but not of fact."

A meeting of the New York stockholders and bondholders was held Oct. 17, when the committee which went to Cincinnati presented its report, relating the incidents of the annual meeting and its results. The account of the meeting differed but little from that already published, but, of course, presented the case from the New York point of view. After some discussion the following resolutions were adopted:

Resolved, As the deliberate sense of this meeting, that the list of Directors headed with the name of Mr. W. A. F. Manice composes the duly elected directors of the Ohio & Mississippi Railroad Company; that the pretended election of any other ticket is a false pretense set up in violation of a custom that is universal, and of a law that is thoroughly established; that it threatens the sacred rights of the stockholders of this company, and if submitted to as a precedent would be subversive of the interests of all owners of corporate property.

Resolved, Further, that our directors be and they are hereby authorized and requested by all lawful means to insist upon, demand, and establish their right to administer the affairs of the company during the year for which they are elected, and that, to enable them to employ efficient counsel, and such other aids as they may deem necessary to this end, they be requested to invite the stockholers to contribute 15 cents per share upon the stock held by them respectively.

Resolved, That the said directors be and they are hereby authorized to appoint one or more of their number a protective committee to carry out the wishes of this meeting, and that when we adjourn it be to meet subject to the call of the Chairman.

The New York Board has completed a temporary organization. It is said that an effort to obtain a judicial decision as to which is the legal board will be made very soon.

Olean, Bradford & Warren.

A company by this name was recently organized in Pennsylvania to build a railroad from Bradford, Pa., northeast to the State line, about seven miles. Another company with the same name has now been organized in New York to build the 10 miles from the State Line to the Buffalo, New York & Philadelphia at Olean. The two companies will probably be consolidated. Surveys of the road have been begun.

Pacific Railroads and the Government.

It is reported from Washington that the Union and Central Pacific companies are preparing to press upon Congress the acceptance of the proposition made by them last year, the payment of a fixed annual sum by which each company, to be added to the earnings for Government transportation and applied as a sinking fund for the payment at maturity of the government subsidy bonds issued to the two companies.

Pennsylvania.

A meeting was held at the Produce Exchange, New York, Oct. 17, of parties having claims against the Pennsylvania Railroad Company for goods destroyed in the Pittsburgh riots. The committee appointed at a previous meeting presented a long report, which was summed up in the following:

"In obedience to the resolution adopted at your last meeting, that this committee should suggest a plan of procedure, they respectfully recommend the following for your consideration:

"*First*—That the proposition of settlement of the Pennsylvania Railroad Company be rejected.

"*Second*—That suits be instituted against the railroad company and the County of Allegheny with as little delay as possible.

"*Third*—That the venue of those suits be laid in the State of New York if counsel approve.

"*Fourth*—That all claimants are requested to make common cause in their prosecution, paying pro rata to the amount involved, the expenses incurred. That they shall appoint from their number a committee of three who shall have general supervision over the same, and report from time to time the progress attained, but in case claimants desire to do so, they can employ associate counsel at their own expense.

"*Fifth*—That the Pennsylvania Railroad Company has not inspired us with confidence by its treatment of obligations arising out of the unfortunate strike riots at Pitlsburgh in July last, and by its vacillating course has wearied our patience and forfeited our forbearance and sympathy."

After some discussion the report was accepted and a committee appointed as recommended. It consists of A. E. Orr, S. D. Harrison and James F. Joyce.

Peoria & Rock Island.

The purchasers of this road at the recent foreclosure sale have organized a new company, to be known as the Rock Island & Peoria Railroad Company; the capital stock is fixed at $1,500,000. The offices of the new company will be at Rock Island, Ill.

Portland & Ogdensburg.

The Vermont Court of Chancery has granted an application for the appointment of a receiver for the Vermont Division, and has appointed to that position A. B. Jewett, the Superintendent, and A. W. Hastings, the Treasurer of the road. The application was made on account of failure to pay the interest on the perferred bonds. There will be no change in the immediate management of the roads.

Philadelphia & Reading

The coroner's jury on the persons killed in the recent accident on the Pickering Valley Branch brought in a verdict freeing the company from censure so far as the wash-out was concerned, holding that the storm of Oct. 4 was phenomenal in its character and could not be provided against by the exercise of ordinary care and foresight. The jury, however, blamed the trainmen for running the engine backwards and making up the train with the milk cars in the rear, contrary to the rules and general practice of the road. They also blamed the company for the practice of placing iron rods or gratings over the car windows, which would prevent the escape of passengers from a wrecked car in many cases.

Pittsburgh & Lake Erie.

The contractors on this road having made preparations to build a crossing of the Lawrence Branch of the Pittsburgh, Fort Wayne & Chicago road at Mahoningtown, Pa., the Pennsylvania Company applied to the Court of Common Pleas for an injunction to prevent them. The Court, after hearing arguments, refused to grant the injunction.

Counsel for the Pittsburgh & Lake Erie Company have since applied to the Court for a decree to regulate the manner of crossing and adjudicate all the questions relating thereto. That the Court has the necessary authority to make such a decree, has been decided by the Supreme Court of the State.

At latest accounts the Pennsylvania Company had a number of trackmen on the ground to prevent any attempt to lay the crossing by force.

Rochester & State Line.

Work on this road has been temporarily stopped by a strike among the workmen employed by some of the sub-contractors, but it was expected that the matter would be settled and work resumed this week. The sub-contractors complain that they do not receive their money regularly and are obliged to take part of their pay in bonds, which they cannot sell at any reasonable discount.

Sabine Pass & Northwestern.

Work was begun on this road in June last and the company has now completed a section of 12 miles, from Lawrence, on the Texas & Pacific, south to the town of Kaufman. Work on the grading is in progress between Kaufman and Cedar Creek, 15 miles. The road is of 3 ft. gauge, and is intended to run from Sherman, Tex., southeast through Lawrence, Kaufman, Palestine, Homer and Beaumont to Sabine Pass, about 330 miles.

Somerset & Essex.

A company by this name has been organized to build a railroad from a point on the Delaware & Bound Brook road in Bridgewater township, Somerset County, N. J., northeast to a point on the Morris & Essex road near Roseville Junction in Newark. The distance is 23 miles, and for about 10 miles the line is parallel and close to the New Jersey Central. The capital stock is to be $1,000,000, and the incorporators are Nathaniel Mills, Stephen E. Garretson, Garrett B. Staats, Joseph H. Van Cleef, Peter Ayers, Stephen A. Beekman, Henry Hegeman, John Perbles, Andrew M. Baird, L. Brainerd Clark, Elijah Hunt and Henry W. Baird, of Hillsborough, N. J., and W. H. Loomis, of New York. The object of such a road is not apparent.

Southern Railroad Meeting.

A meeting of Southern railroad managers was held in Memphis, Tenn., Oct. 17, the roads represented being the Memphis & Charleston; East Tennessee, Virginia & Georgia; Nashville, Chattanooga & St. Louis; Louisville & Nashville; Mobile & Ohio; New Orleans, Jackson & Northern; Mississippi Central; Memphis & Little Rock; Illinois Central, and St. Louis, Iron Mountain & Southern. President E. W. Cole, of the Nashville, Chattanooga & St. Louis, was chosen Chairman. The session lasted two days, with closed doors, but it is understood that it was devoted chiefly to the consideration of the business between Texas and the Southern and Southeastern States. It resulted in the adjustment of the long standing trouble between the Iron Mountain and Memphis & Little Rock people. Both parties agreed to make some concessions and to restore the old rates and the Iron Mountain consented to allow a through sleeping coach to run between Memphis & Texarkana.

Another meeting of general passenger agents was to be held at Chattanooga, Oct. 23, for the purpose of revising the rates and divisions between the Southeast and Texas. The question of New Orleans, Florida and Texas excursion rates, and tickets from the North for the winter season, will also be brought up.

Southeastern, of Canada.

This company, claiming that the lessee of the road, the Connecticut & Passumpsic Rivers Company, had allowed the road to run down until it was in an unsafe condition, on Oct. 21 put a number of men at work to repair the track at North Troy, Vt., where it was claimed to be particularly unsafe. They tore up the track for a short distance, stopping all through trains. Local trains between North Troy and St. John's, P. Q., are run by the Southeastern Company with equipment borrowed from the Central Vermont, but no trains of the Passumpsic Company are run at present. The Passumpsic Company claims that the present action is entirely unwarranted, and that the breach of contract is entirely on the part of the Southeastern. Under the lease the company was to make all necessary renewals, the lessee making only ordinary repairs necessary to the operation of the road.

Shawnee, Hocking Valley & Southern.

A certificate of incorporation has been filed for a company of this name, which has been organized to build a road from a point near Shawnee, O., on the Newark, Somerset & Straitsville road, south by west about 30 miles to McArthur, on the Marietta & Cincinnati road.

St. Louis & San Francisco.

The St. Louis *Republican* reports that the directors of this company are now considering the question of building an extension of the road from Pacific, Mo., to St. Louis, 37 miles, to avoid the necessity of using the Missouri Pacific track to St. Louis. It further reports that negotiations are pending with the St. Louis County Railroad Company for the purchase of its right of way to the Union Depot in St. Louis. A number of the directors are now making a trip of inspection over the road.

St. Louis & Southeastern.

The Auditor's report of gross earnings for the month of September is as follows:

	St. Louis Div.	Kentucky Div.	Tennessee Div.	Entire Line.
Passengers	$21,088 27	$8,707 37	$5,257 96	$35,053 60
Freight	41,550 99	19,363 22	8,494 36	69,408 57
Mail, express, etc.	2,654 42	1,043 41	535 90	4,233 73
Total	$65,293 68	$29,114 00	$14,288 22	$108,695 90
Earnings per mile	310 92	297 08	304 00	306 20

As compared with 1876, the St. Louis Division shows an increase of $6,038,49, or 10.2 per cent.; the Kentucky Division a decrease of $2,761.61, or 8.7 per cent.; the Tennessee Division an increase of $1,019.05, or 7.7 per cent., and the whole road an increase of $4,295.93, or 4.1 per cent.

The Receivers have begun proceedings in the United States Circuit Court at Louisville to enjoin the Louisville & Nashville and the Nashville, Chattanooga & St. Louis companies from continuing to charge, as they have done for some time, local rates on freight delivered to them by this road at Nashville and bound for points south. The case was to be heard this week.

St. Paul & Pacific.

The last rail on the Glyndon Cut-off, or Barnes-Breckenridge Connection, was laid Oct. 20. The new line is 22 miles long, from Breckenridge, Minn., northward to Barnes, and connects the First Division of the St. Paul & Pacific with the completed section of the St. Vincent Extension from Barnes northward 83 miles to Fisher's Landing on Red River. This section of the St. Vincent Extension has been in operation for some time, but has been dependent for an outlet upon the Northern Pacific, which it crosses at Glyndon, eight miles north of Barnes. The new connection completes a continuous line 322 miles long from St. Paul to Fisher's Landing. Through trains began to run from St. Paul Oct. 22. The new connection has been built with money subscribed by the Amsterdam bondholders. It extends nearly its whole length along the eastern border of the Red River valley, through one of the most productive wheat districts in the country, which, however, has a very severe climate and a very small population.

United New Jersey.

"V. L. B." (Mr. Vincent L. Bradford) writes to the Philadelphia *Ledger* on the legal position of the lease. He holds that each stockholder of the United Company has an individual right in the lease and must necessarily be made a party to any proceedings to set it aside. No injunction would bar the Pennsylvania Railroad Company from a suit to recover dividends due under lease and unpaid, unless each stockholder had been made a party and given due opportunity to be heard. He also holds that the Longstreets have no real standing in a suit to set the lease aside, and that all they can demand is that their stock be purchased at its market value.

The *Ledger* says that the Longstreets have forfeited their standing in court by selling their stock. The purchasers of the 240 shares owned by them were Andrew and Thomas Carnegie, acting, probably, for President Scott.

Waynesville, Port William & Jeffersonville.

Track is now laid on this road from the Dayton & Southeastern crossing at Allentown, O., west by south to Port William, 11 miles. Work is progressing between Port William and Waynesville. The road is of 3 ft. gauge, and is intended to form part of a new line between Cincinnati and Columbus.

Western, of Minnesota.

The last rail on this road, formerly known as the Brainerd Branch of the St. Paul & Pacific, was laid Oct. 20, and regular trains will soon be running over it. The line is 60 miles long, from Sauk Rapids, Minn., northward to Brainerd on the Northern Pacific, and completes a line 136 miles long from St Paul to Brainerd. Nearly all the grading was done and track laid on the six miles from Sauk Rapids to Watab several years ago, but work was stopped and the road remained unfinished till this summer, when the present company was organized to complete it in accordance with an act of the Minnesota Legislature offering to transfer the unfinished road and the land grant to any parties who would comply with the terms of the act. The Western Company, which has now finished and owns the road, is controlled by the Northern Pacific.

West Virginia Central.

This company has completed a preliminary organization and filed the necessary certificate in West Virginia. The capital stock is $1,000,000, with privilege of increase to $10,000,000; the corporators are Alexander Boudinot, Wm. H. Ross, Stephen K. Kane, E. L. Spain, Alpha Bonney, John A. Lewis and T. N. Corbyn, all of Philadelphia. The line of the proposed road is from the Ohio River at Ceredo, Wayne County, W. Va., east to Charleston; then up the Great Kanawha to the mouth of Gauley; then up the Gauley River to its source and thence eastward to Harrisonburg, Va.; then east through Madison, Culpepper, Fauquier and Stafford counties to the Potomac at Aquia Creek. The length of the road proposed is about 300 miles.